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DVD-Video Recorder

DVDR615

DVDR615/69

Service
Service
Service

Service Manual

CLASS 1
LASER PRODUCT

RW
DVD+ReWritable

DVD VIDEO

COMPACT disc DIGITAL VIDEO

COMPACT disc DIGITAL AUDIO

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Version 1.0

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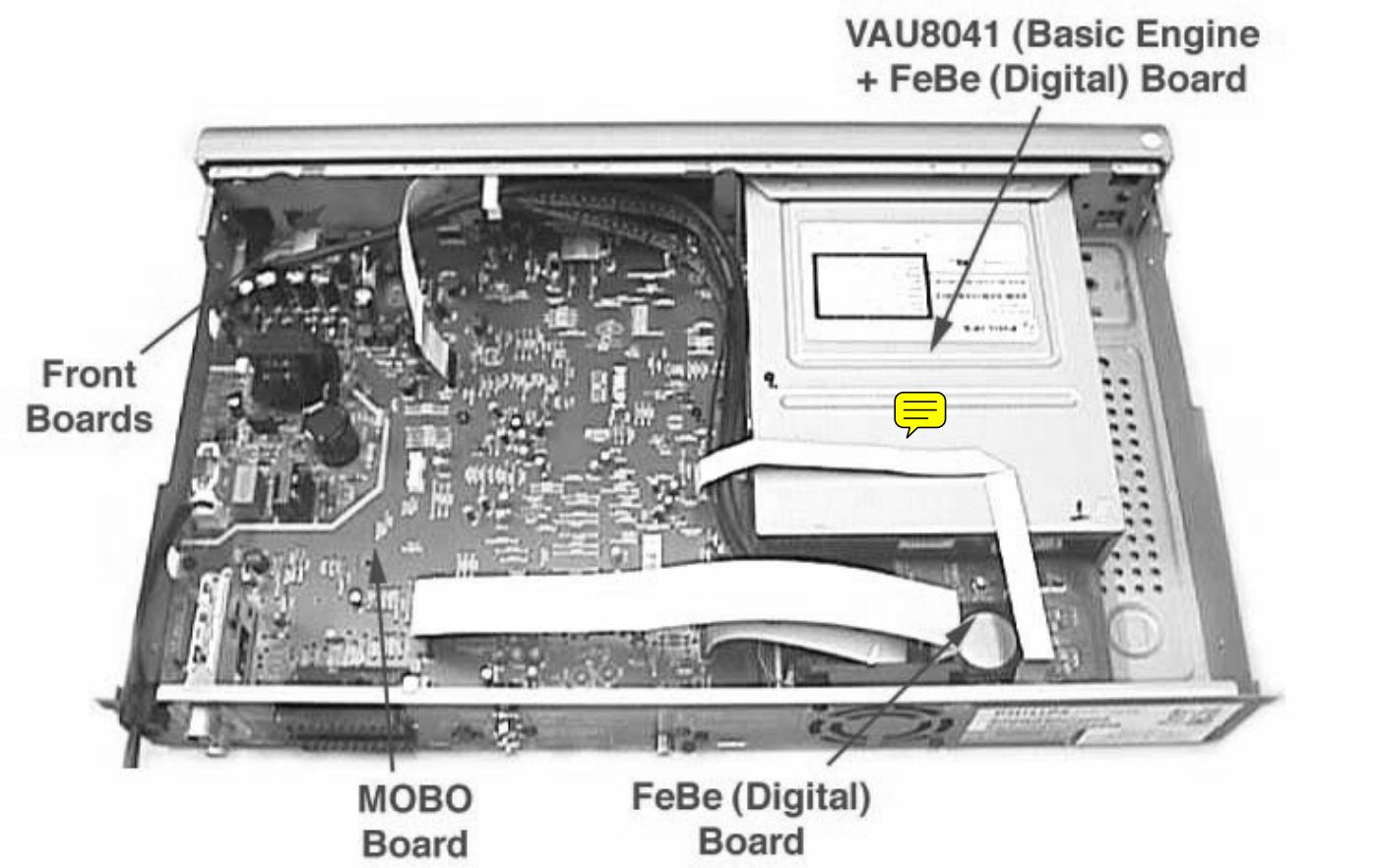
1. Technical Specifications and Connection Facilities

1.1 PCB Locations



1.2 Diversity Matrix and Read and Write speed

	VFM RANGE		
Module / Pcb Application	DVDR615/69		
MOBO Board:	04 AP2 3139 248 82902	-	-
Front Board: 12NC: 3139 248 83071	x	-	-
VAU8041/21 DS version: E1_AV3_4 12NC: 9305 025 84121 pcb: 3104 128 09281 Drive: AV3.5	x	-	-

Type of Disc (Function)	Disc Rotation Speed
Read Speed CD	CAV 7x
Read Speed DVD	CAV 4x
Write Speed DVD+RW	ZCAV 2.4x
Write Speed DVD+R	ZCAV2.4x

1.3 General:

Mains voltage : 198V-276V
Mains frequency : 43 Hz - 63Hz
Power consumption (record) : 27 W
Power consumption (AV loop through) : < 15W
Power consumption low power stand-by : < 3 W

1.4 RF Tuner

Test equipment:Fluke 54200 TV Signal generator
Test streams:PAL BG Philips Standard test pattern

1.4.1 System:

PAL B/G, PAL D/K, PAL I

1.4.2 RF - Loop Through:

Frequency range : 45 MHz - 860 MHz
Gain: (ANT IN - ANT OUT) : +6 dB to -2dB

1.4.3 Radio Interference:

input voltage /3 tone method (+40 dB min) : 85dBµV

1.4.4 Receiver:

PLL tuning with AFC for optimum reception
Frequency range: : 45.25 MHz - 857 MHz
Sensitivity at 40 dB S/N : ≥ 60dBµV at 75Ω (video unweighted)

1.4.5 Video Performance:

Channel 25 / 503,25 MHz,
Test pattern: PAL BG PHILIPS standard test pattern,
RF Level 74 dBV
Measured on Cinch Out

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Frequency response: : 0.1- 4.00 MHz ± 3dB
Group delay (0.1 MHz - 4.4 MHz) : 0 nsec ± 150nsec

1.4.6 Audio Performance:

Audio Performance Analogue - HiFi:
Frequency response at Cinch Out (L+R) output: : 100 Hz - 12 kHz / 0± 3dB
S/N according to DIN 45405, 7, 1967 and PHILIPS standard test pattern video signal: : ≥ 50dB, unweighted
Harmonic distortion (1 kHz, ± 25 kHz deviation): : ≤ 1.5%

Audio Performance NICAM:
Frequency response at Cinch Out (L+R) output: : 40 Hz - 15 kHz 0 ± 3dB
S/N according to DIN 45405, 7, 1967 and PHILIPS standard test pattern video signal: : ≥ 60 dB unweighted
Harmonic distortion (1 kHz): : ≤ 0.5 %

1.4.7 Tuning

Automatic Search Tuning
scanning time without antenna : typ. 3 min.
stop level (vision carrier) : ≥ 37dBµV
Maximum tuning error of a recalled program : ± 62.5 kHz
Maximum tuning error during operation : ± 100 kHz

Tuning Principle
automatic B,G, I and DK detection
manual selection in "STORE" mode

1.5 Analogue Inputs / Outputs

1.5.1 External 1

Component Video Cinch Y/Pb/Pr
according to EIO-770-1-A, EIA-770-2-A

Audio - Cinch
Input voltage : 1Vpp ± 3dB
Input impedance : >10kΩ

1.5.2 External 2

Audio- Cinch
Output voltage : 2Vrms max.
Output impedance : >10kΩ

Video- Cinch
Output voltage : 1 Vpp ± 3dB
Output impedance : 75 Ω

Video - YC (Hosiden)
According to IEC 933-5
Superimposed DC-level on pin 4 (load > 100kΩ)
< 2.4V is detected as 4:3 aspect ratio
> 3.5V is detected as 16:9 aspect ratio
Input voltage Y :1Vpp ± 3dB
Input impedance Y :75 Ω
Input voltage C :burst 300 mVpp ± 3 dB
Input impedance C :75 Ω

1.5.3 Audio/Video Front Input Connectors

Audio - Cinch
Input voltage : 2.2 Vrms
Input impedance : >10kΩ

Video - Cinch
Input voltage : 1 Vpp ± 3dB
Input impedance : 75 Ω

Video - YC (Hosiden)
According to IEC 933-5
Superimposed DC-level on pin 4 (load > 100kΩ)
< 2.4V is detected as 4:3 aspect ratio
> 3.5V is detected as 16:9 aspect ratio
Input voltage Y : 1Vpp ± 3dB
Input impedance Y : 75 Ω
Input voltage C : burst 300 mVpp ± 3 dB
Input impedance C : 75 Ω

1.5.4 Out 1

Component Video Cinch Y/Pb/Pr
according EIO-770-1-A, EIA-770-2-A

Audio- Cinch
Output voltage : 2Vrms max.
Output impedance : >10kΩ

1.5.5 Out 2

Audio- Cinch
Output voltage : 2Vrms max.
Output impedance : >10kΩ

Video- Cinch
Output voltage : 1 Vpp ± 3dB
Output impedance : 75 Ω

Video - YC (Hosiden)
According to IEC 933-5
Superimposed DC-level on pin 4 (load > 100kohm)
< 2.4V is detected as 4:3 aspect ratio
> 3.5V is detected as 16:9 aspect ratio
Output voltage Y : 1Vpp +10/-15%
Output voltage C : 300mVpp +1/-4dB

1.6 Video Performance

All outputs loaded with 75 Ohm
SNR measurements over full bandwidth without weighting.

1.6.1 SCART (RGB)

SNR : > 48 dB
Bandwidth : 4.8 MHz – 3dB

1.7 Audio Performance CD

1.7.1 Cinch Output Rear

Output voltage 2 channel mode : 2Vrms ± 1dB
Channel unbalance (1kHz) : <0.22dB
Crosstalk 1kHz : >100dB
Crosstalk 16Hz-20kHz : >87dB
Frequency response : ±0.2dB max
Signal to noise ratio : >85 dB
Dynamic range 1kHz : >83dB
Distortion and noise 1kHz : >83dB

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Distortion and noise 16Hz-20kHz	:	>75dB
Intermodulation distortion	:	>70dB
Mute	:	>95dB
Outband attenuation:	:	>40dB above 30kHz

1.8 Digital Audio Output

1.8.1 Coaxial

CDDA/ LPCM (incl MPEG1)	:	according IEC958
MPEG2, AC3 audio	:	according IEC1937
DTS	:	according IEC1937, amendment 1

1.8.2 Optical

CDDA/ LPCM (incl MPEG1)	:	according IEC958
MPEG2, AC3	:	according IEC937
DTS	:	according IEC937, amendment 1

1.9 Digital Video Input (IEEE 1394)

1.9.1 Applicable Standards

Implementation according:
IEEE Std 1394-1995
IEC 61883 - Part 1
IEC 61883 - Part 2 SD-DVCR (02-01-1997)
Specification of consumer use digital VCR's using 6.3 mm magnetic tape - dec.1994
Mechanical connection according:
Annex A of 61883-1

1.10 Dimensions and Weight

Height of feet	:	5.5mm
Apparatus tray closed	:	WxDxH :435 x 285x 65mm
Apparatus tray open	:	WxDxH :435 x 422x 65mm
Weight without packaging	:	app. 4 kg ± 0.5 kg
Weight in packaging	:	app. 6.5 kg

1.11 Laser Output Power & Wavelength

1.11.1 DVD

Output power during reading	:	0.8mW
Output power during writing	:	20mW
Wavelength	:	660nm

1.11.2 CD

Output power	:	0.3mW
Wavelength	:	780nm

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2. Safety Information, General Notes

2.1 Safety Instructions

2.1.1 General Safety

Safety regulations require that during a repair:
- Connect the unit to the mains via an isolation transformer.
- Replace safety components, indicated by the symbol ▲, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, you must return the unit in its original condition. Pay, in particular, attention to the following points:
- Route the wires/cables correctly, and fix them with the mounted cable clamps.
- Check the insulation of the mains lead for external damage.
- Check the electrical DC resistance between the mains plug and the secondary side:
  1. Unplug the mains cord, and connect a wire between the two pins of the mains plug.
  2. Set the mains switch to the 'on' position (keep the mains cord unplugged!).
  3. Measure the resistance value between the mains plug and the front panel, controls, and chassis bottom.
  4. Repair or correct unit when the resistance measurement is less than 1 MΩ.
  5. Verify this, before you return the unit to the customer/ user (ref. UL-standard no. 1492).
  6. Switch the unit 'off', and remove the wire between the two pins of the mains plug.

2.1.2 Laser Safety

This unit employs a laser. Only qualified service personnel may remove the cover, or attempt to service this device (due to possible eye injury).

Laser Device Unit

Type	:	Semiconductor laser GaAlAs
Wavelength	:	650 nm (DVD)
	:	780 nm (VCD/CD)
Output Power	:	20 mW (DVD+RW writing)
	:	0.8 mW (DVD reading)
	:	0.3 mW (VCD/CD reading)
Beam divergence	:	60 degree

Figure 2-1

Note: Use of controls or adjustments or performance of procedure other than those specified herein, may result in hazardous radiation exposure. Avoid direct exposure to beam.

2.2 Warnings

2.2.1 General

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD,). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are at the same potential as the mass of the set by a wristband with resistance. Keep components and tools at this same potential.
  Available ESD protection equipment:
  – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  – Wristband tester 4822 344 13999.
- Be careful during measurements in the live voltage section. The primary side of the power supply (pos. 1005), including the heatsink, carries live mains voltage when you connect the player to the mains (even when the player is 'off'!). It is possible to touch copper tracks and/or components in this unshielded primary area, when you service the player. Service personnel must take precautions to prevent touching this area or components in this area. A 'lightning stroke' and a stripe-marked printing on the printed wiring board, indicate the primary side of the power supply.
- Never replace modules, or components, while the unit is 'on'.

2.2.2 Laser

- The use of optical instruments with this product, will increase eye hazard.
- Only qualified service personnel may remove the cover or attempt to service this device, due to possible eye injury.
- Repair handling should take place as much as possible with a disc loaded inside the player.
- Text below is placed inside the unit, on the laser cover shield:

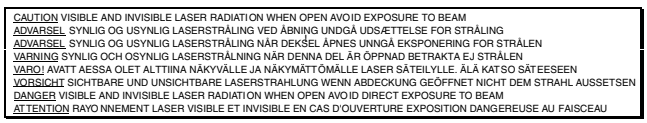
CAUTION VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID EXPOSURE TO BEAM
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING UNDGÅ UDSÆTTELSE FOR STRÅLING
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN
VARNING SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD BETRAKTA EJ STRÅLEN
VARO! AVATT AESSA OLET ALTTIINA NÄKYVÄLLE JA NÄKYMÄTTÖMÄLLE LASER SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN
VORSICHT SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETSEN
DANGER VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM
ATTENTION RAYO NNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE EXPOSITION DANGEREUSE AU FAISCEAU

Figure 2-2

2.2.3 Notes

Dolby
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DOLBY SURROUND
PRO • LOGIC

Figure 2-3

Trusurround
TRUSURROUND, **SRS** and symbol (fig 2-4) are trademarks of SRS Labs, Inc. TRUSURROUND technology is manufactured under licence frm SRS labs, Inc.

Figure 2-4

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Video Plus

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Figure 2-5

Macrovision

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners.

Use of this copyright protection technology must be autorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

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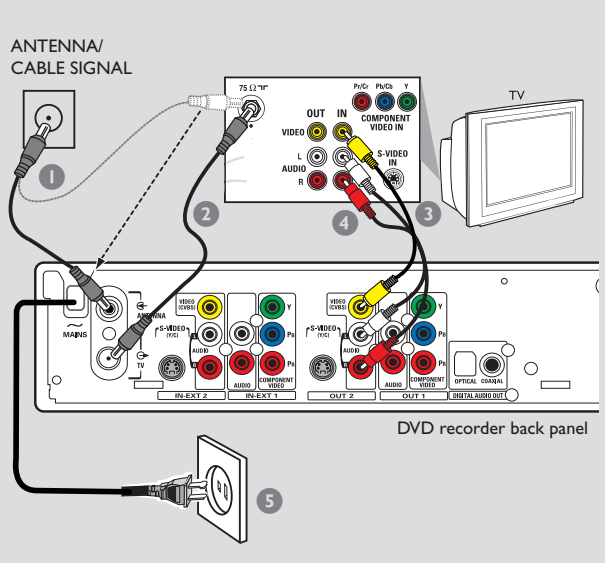
3. Directions For Use

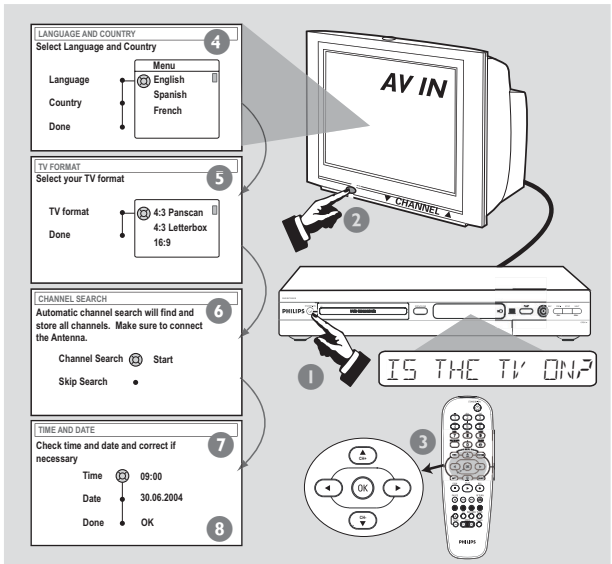
The following excerpt of the Quick Use Guide serves as an introduction to the set.
The complete Direction for Use can be downloaded in different languages from the internet site of Philips Customer Care Center:
www.p4c.philips.com

QUICK USE GUIDE

DVDR610
DVDR615
DVDR616

12nc: 3139 246 14151



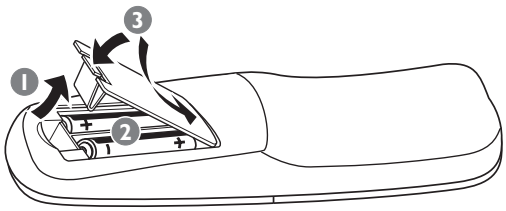


1 Connect DVD recorder

1. Remove the antenna cable plug from your TV (or Satellite Receiver/Cable Box). Connect it to the **ANTENNA** input socket at the back of the DVD recorder.
2. Use the supplied antenna cable to connect the DVD recorder's **TV** output socket to the antenna input socket at the back of your TV set
3. Use the supplied AV cables (yellow plug) to connect the DVD recorder's **VIDEO (CVBS) (OUT 2)** socket to the Video In socket at the back of your TV set.
4. Use the supplied AV cables (red/white plugs) to connect the DVD recorder's **AUDIO L/R (OUT 2)** socket to the audio input socket at the back of your TV set.
5. Connect the power cable from the DVD recorder's **~ MAINS** to the power supply.

Helpful Hint:
If your TV does not have the above-mentioned connectors, please refer to the user manual for more information on others possible connection to your TV set.

2 Prepare the remote control



3 Start first installation

1. Press **STANDBY-ON** ⏻ on the DVD recorder to switch it on.
2. Switch on the TV set and select the correct video in channel, the First Installation menu appears on the TV.

   NO PICTURE! Press the TV/AV button or CHANNEL ▲▼ button on the TV to select the correct video in channel, for example, 'EXT', '0', or 'AV'.
3. Press ▲▼ to select an item in the menu.
   Press ▶ to access the selected item's options.
   Press ◀ to confirm your selection.
   When you complete, select { **Done** } in the menu and press **OK** to continue.
4. { **Language and Country** } menu appears.
   { **Language** } – select on-screen display language.
   { **Country** } – select country of your residence.
5. { **TV Format** } menu appears.
   { **TV Format** } – select TV screen display.
6. { **Channel Search** } menu appears.
   Press **OK** to start automatic TV channel search.
   Once the TV channel search complete, the total number of channels found appears.
7. { **Time and Date** } menu appears.
   If the time and date shown on the TV are not correct, press ▶ to enter the respective time/date field. Press ▲▼ to change the first digit and press ▶ to go to the next digit field. Once complete, press **OK** to confirm.
8. Press ▼ to select { **Done** } and press **OK** to save the changes.
   ➜ The first installation is now complete.

The DVD recorder is ready for use!
See next page for basic recording and playback.

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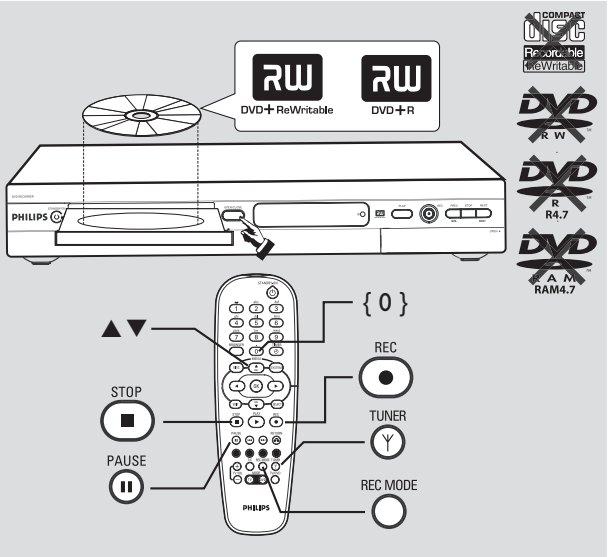
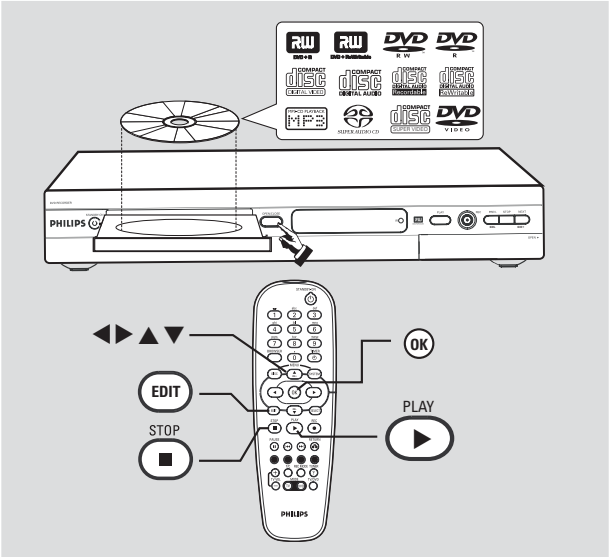
... cont.





4 Start manual recording

1. Insert a recordable DVD+R(W) with the label side facing up.
2. Press **TUNER** on the remote control to see the TV programmes, then press ▲▼ to select the programme number you wish to record.
   ➜ If you wish to record from additional device (e.g. Video Cassette Recorder), press button ▲▼ on the remote control to select the correspond external input channel.
   For example, select { EXT2 } if you have connected the VCR to **IN-EXT2** socket at the back of the DVD recorder.
3. Press **REC MODE** to select a desired recording mode. It defines the picture quality and the maximum recording time for a disc.

Record Mode	Picture Quality	Maximum Recording Time per Disc
M1	High quality (HQ)	1 hour
M2	DVD quality-Standard Play (SP)	2 hours
M2x	DVD quality-Standard Play Plus (SP+)	2.5 hours
M3	S-VHS quality-Long Play (LP)	3 hours
M4	VHS quality-Extended Play (EP)	4 hours
M6	VHS quality-Super Long Play (SLP)	6 hours
M8	VHS quality-Super Extended Play (SEP)	8 hours

4. Press **REC** ● to start recording.
   - If required, you can press **REC** ● twice to start a 30-minute recording. Each time you press **REC** ● button, you will add 30 minutes to the recording time.
5. During recording, you may press **PAUSE II** to pause the recording and press **REC** ● to continue.
6. To stop the recording, press **STOP** ■.
   ➜ Wait until the message disappears from the display panel before you remove the disc.

5 Start Playback

1. Insert a disc with the label side facing up.
2. Playback will start automatically.
   ➜ If a dialogue appears on the TV showing { Do you want to access the disc content }, press ▲▼ to select { Yes } to show the disc content or { No } to start playback, then press **OK** to confirm
   ➜ If a disc menu appears, press ◀▶▲▼ to navigate within the menu, highlight a title and press **OK** or **PLAY** ▶ to start playback.

NO SOUND! Connect the AUDIO L/R (red/white) sockets at the back of the DVD recorder to the correspond AUDIO input sockets on a TV set, stereo system or receiver. Turn on the connected system and select the appropriate channel.

3. To stop playback, press **STOP** ■.

To watch the TV programmes

1. Press **TUNER** on the remote control, then press ▲▼ to select the programme number.

To play a DVD+R on other DVD players, you must finalise it first

1. Press **EDIT** on the remote control.
2. Press ▲▼ to select { **Finalise** } in the menu, then press **OK**.

Once a DVD+R is finalised, no further recording or editing is possible. Unfinalising a DVD+R is not possible.

Detailed playback features and additional functions are described in the accompanying user manual.

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4. Mechanical Instructions

4.1 Dismantling and Assembly of the Set

For item numbers please see the exploded views in chapter 10.

4.1.1 Front Panel Assembly

- After removing the top cover, remove tray front 134+138, see picture 4-1
- Remove the three screws 188
- Release the two snap hooks on the sides and remove the front assembly
- Remove the 4 screws 186 to remove the front plate 184, see picture 4-2

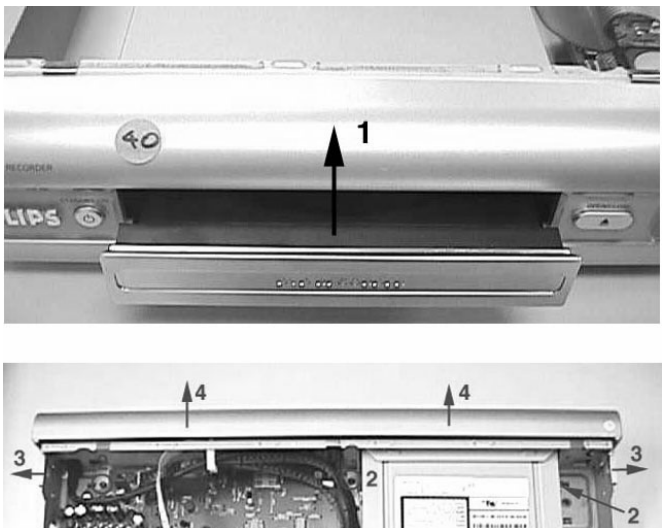

Figure 4-1

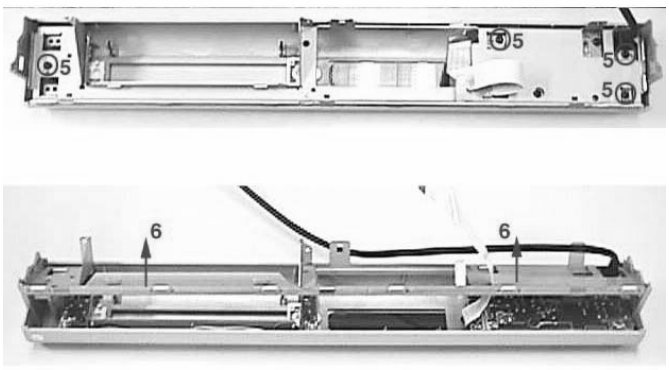

Figure 4-2

4.1.2 Basic Engine VAU8041

- Remove the Front Panel Assembly as given in 4.1.1
- Remove the 6 screws 260, 269 to free the Basic Engine
- Remove the dust cover assembly 147 and 148
- Loosen 2 screws to remove bracket 256
- Loosen 4 screws to remove the Basic Engine metal casing
- Place the Basic Engine in the service position

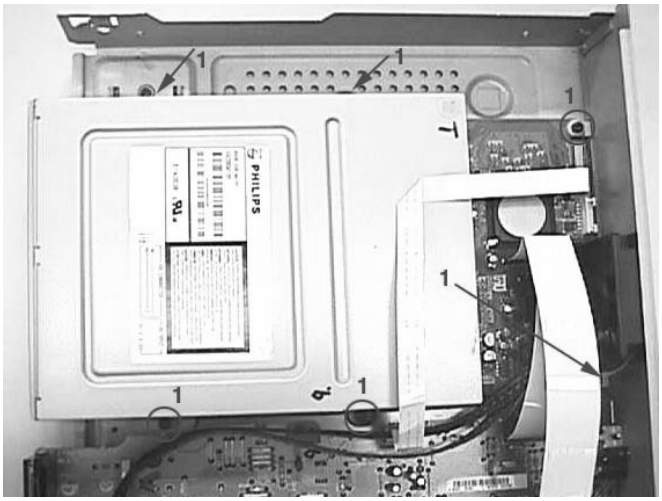

Figure 4-3

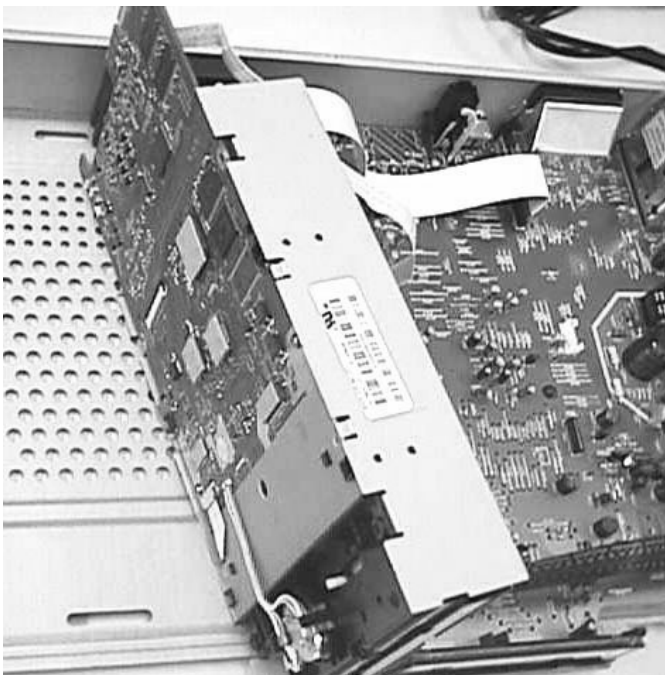

Figure 4-4

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4.1.3 MOBO Board

- Remove the Front Panel assembly as given in 4.1.1
- Remove 6 screws 246 and 254
- Remove 4 screws 270
- Service position is achieved by flipping the MOBO board above the Basic Engine

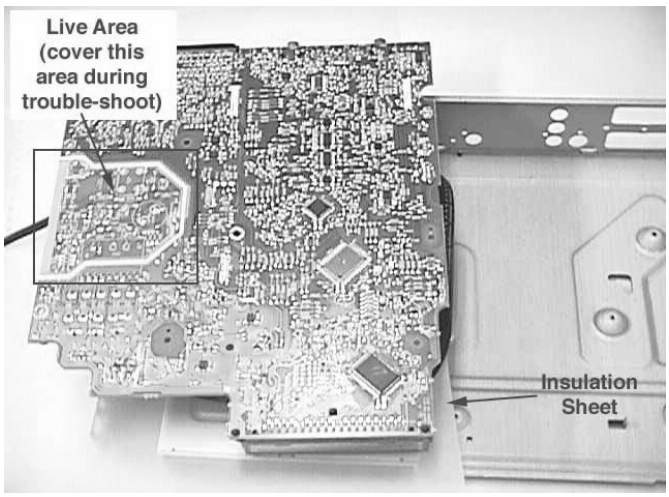

Figure 4-5

4.2 Dismantling and assembly of the VAU8041 Module

4.2.1 General

Follow the dismantling instructions in described order.
Do not place the unit with its PCB on a hard surface (e.g. table), as it could damage the components on it.
Always place something soft (a towel or foam cushion) under it.
Never touch the lens of the OPU.
Take sufficient ESD measures during handling.

4.2.2 Dismantling the FEBE Board

- Remove 4 screws to remove the metal case 150+180
- Remove 2 screws to separate the FEBE board 179 from the main Loader/Drive assembly

Note: After exchange of the PCB (or the Drive mechanism) the complete VAU8041 has to be adjusted! Refer to chapter 8 for adjustment instructions!

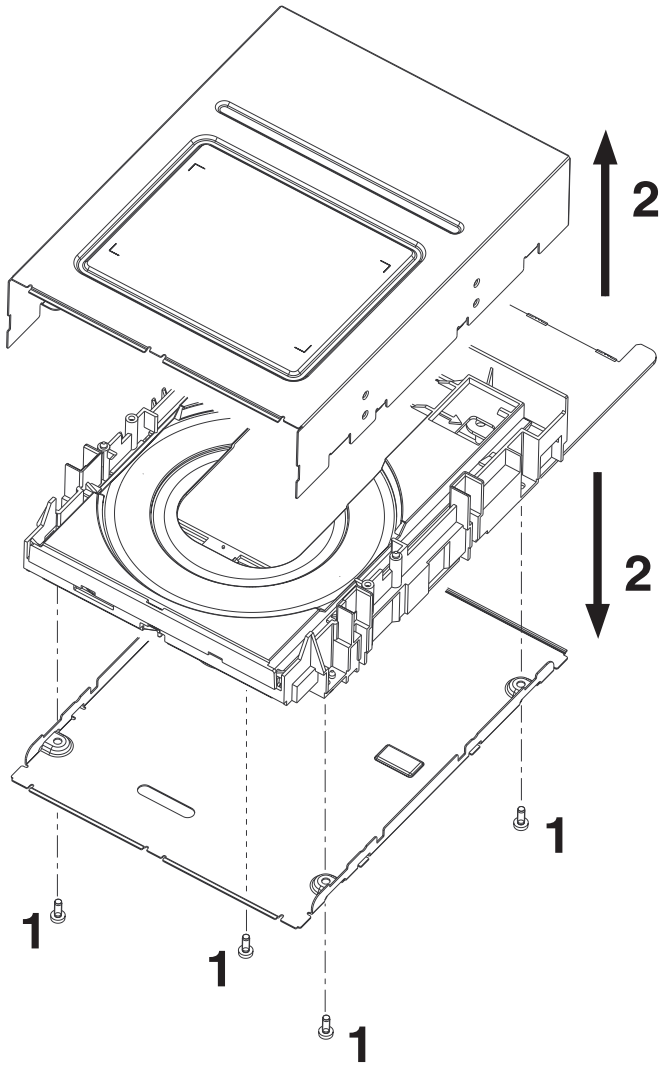

Figure 4-6 VAU8041 Module dismantling

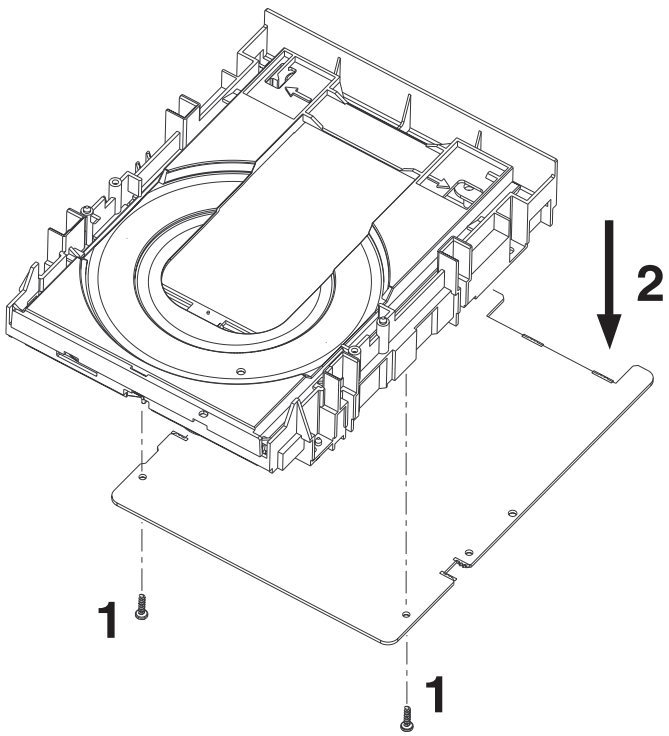

Figure 4-7 Remove FEBE board

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4.2.3 Dismantling the Tray

– Remove the encasing as described in 4.2.2
– Disengage the two holders that fix the tray [1] and pull out the tray [2]

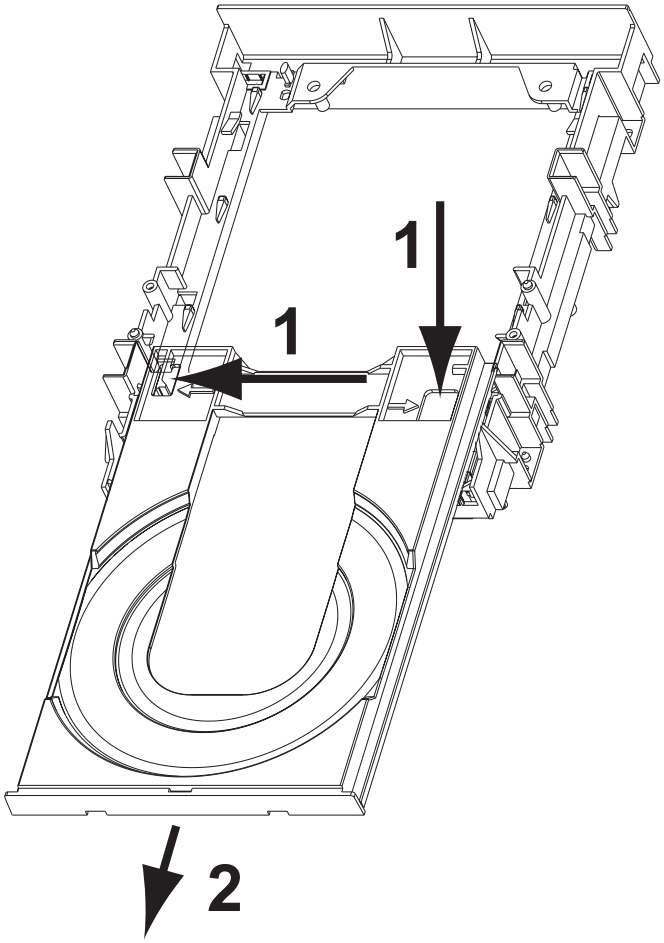

Figure 4-8 Remove Tray

4.2.4 DVD-M (Drive Mechanism)

Caution: Never try to align or repair the DVD-Module itself! Only the factory can do this properly. Service engineers are only allowed to exchange the sledge motor assy.
After Exchanging the DVD-M (or the PCB) the complete drive has to be adjusted! Refer to chapter 8 for adjustment instructions!

– Remove encasing and FEBE board as described in 4.2.2
– Remove the Sealing strip 5 by uncatching it
– Loosen the 4 screws/washer [1] to remove the DVD-M [2]

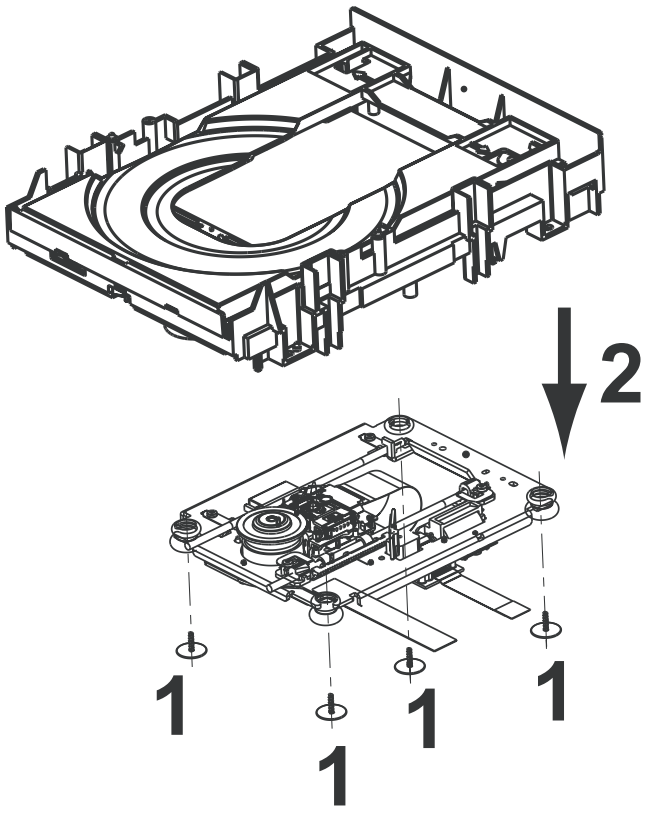

Figure 4-9 Remove DVD-M

4.2.5 Re - assembly

To re-assemble the module, do all processes in reverse order. Take care of the following:

- **Heat Paths:**Put the 5 heat paths (gray rubber pieces) back to their position on the ICs.
- **Complete module:** Place all wires/cables in their original positions
- **Emergency opening slot:** Be sure that the slot for the emergency tray opener is covered by adhesive tape!

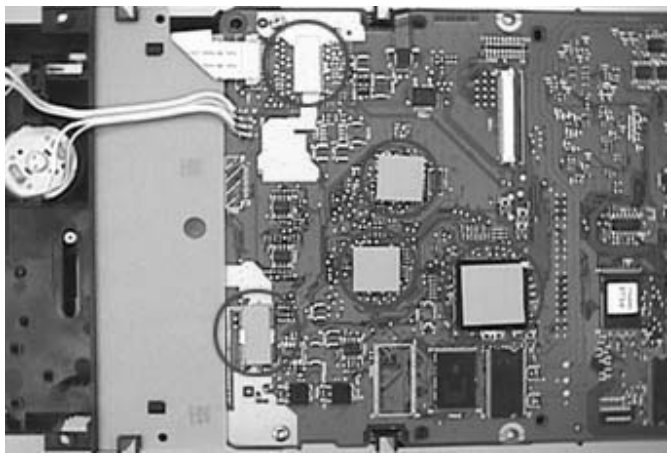

Figure 4-10 Heat Paths

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4.3 Dismantling Instructions

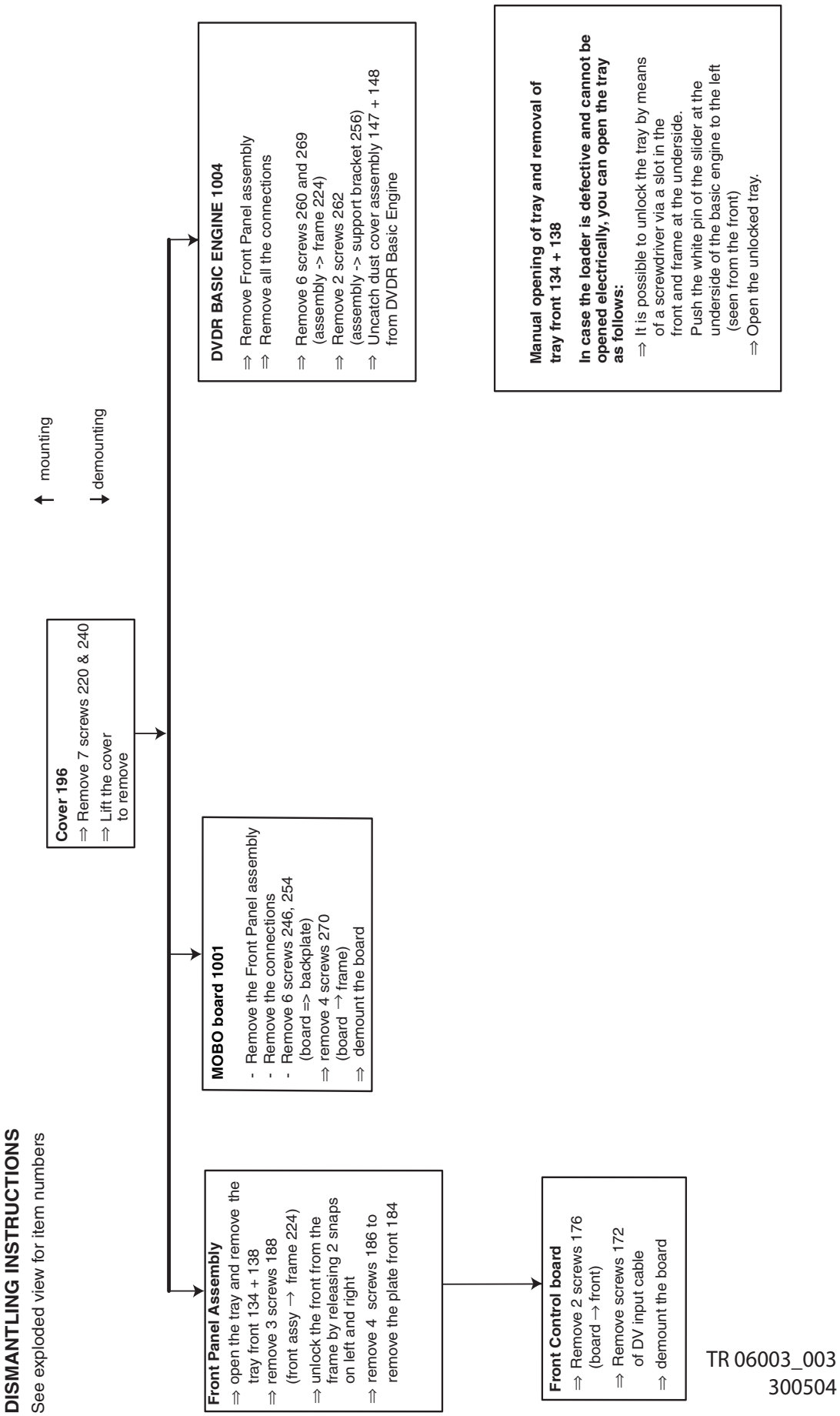
DISMANTLING INSTRUCTIONS
See exploded view for item numbers
mounting
demounting
Cover 196
⇒ Remove 7 screws 220 & 240
⇒ Lift the cover to remove
DVDR BASIC ENGINE 1004
⇒ Remove Front Panel assembly
⇒ Remove all the connections
⇒ Remove 6 screws 260 and 269 (assembly -> frame 224)
⇒ Remove 2 screws 262 (assembly -> support bracket 256)
⇒ Uncatch dust cover assembly 147 + 148 from DVDR Basic Engine
Manual opening of tray and removal of tray front 134 + 138
In case the loader is defective and cannot be opened electrically, you can open the tray as follows:
⇒ It is possible to unlock the tray by means of a screwdriver via a slot in the front and frame at the underside. Push the white pin of the slider at the underside of the basic engine to the left (seen from the front)
⇒ Open the unlocked tray.
MOBO board 1001
- Remove the Front Panel assembly
- Remove the connections
- Remove 6 screws 246, 254 (board => backplate)
⇒ remove 4 screws 270 (board → frame)
⇒ demount the board
Front Panel Assembly
⇒ open the tray and remove the tray front 134 + 138
⇒ remove 3 screws 188 (front assy → frame 224)
⇒ unlock the front from the frame by releasing 2 snaps on left and right
⇒ remove 4 screws 186 to remove the plate front 184
Front Control board
⇒ Remove 2 screws 176 (board → front)
⇒ Remove screws 172 of DV input cable
⇒ demount the board
TR 06003_003
300504

Figure 4-11

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5. Diagnostic Software

Due to the complexity of the DVD recorder, the time to find a defect in the recorder can become long. To reduce this time, the recorder has been equipped with Diagnostic and Service software (DS). The DS offers functionality to diagnose the DVDR hardware and tests the following:

- Interconnections between components
- Accessibility of components
- Functionality of the audio and video paths

This functionality can be accessed via several interfaces:

1. End user/Dealer script interface
2. Command Interface

5.1 End User/Dealer Script Interface

5.1.1 Description

The End user/Dealer script interface gives a diagnosis on a stand alone DVD recorder. During this mode, a number of hardware tests (nuclei) are automatically executed to check if the recorder is faulty. The diagnosis is simply a "fail" or "pass" message. If the message "FAIL" appears on the display, there is apparently a failure in the recorder. If the message "PASS" appears, the nuclei in this mode have been executed successfully. There can be still a failure in the recorder because the nuclei in this mode don't cover the complete functionality of the recorder.

5.1.2 Structure

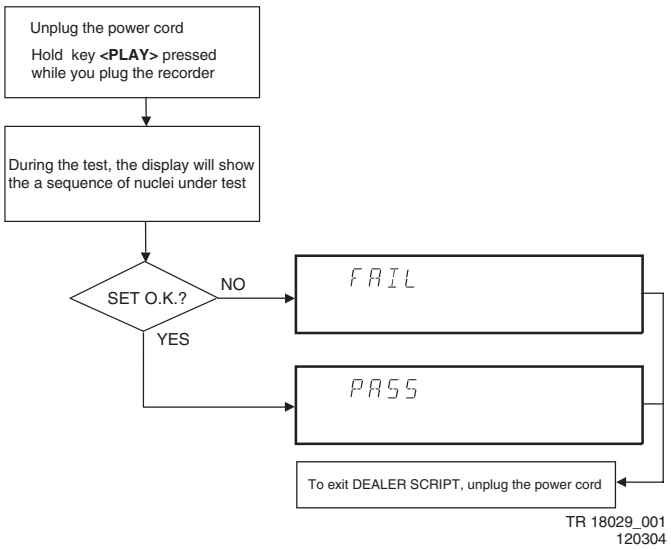

Figure 5-1

The End use/Dealer script executes all diagnostic nuclei that do not need any user interaction and are meaningful on a standalone DVD recorder.

5.1.3 Contents

Included tests:	1.DS_ANAB_COMMUNICATIONECHO_NUC 2.DS_DCB_COMMUNICATIONECHO_NUC 3. DS_BROM_COMMUNICATION_NUC 4. DS_SYS_SETTINGSDISPLAY_NUC 5. DS_CHR_DEVTYPEGET_NUC 6. DS_CHR_INT_PIC_NUC 7. DS_CHR_DMA_NUC 8. DS_BROM_WRITEREAD_NUC 9. DS_NVRAM_COMMUNICATION_NUC 10. DS_NVRAM_WRITEREAD_NUC 11. DS_SDRAM_WRITEREADFAST_NUC 12. DS_FLASH_WRITEREAD_NUC 13.DS_FLASH_CHECKSUMPROGRAM_NUC 14.DS_SYS_HARDWAREVERSIONGET_NUC 15. DS_VIP_DEVTYPEGET_NUC 16. DS_VIP_COMMUNICATION_NUC 17. DS_DVIO_LINKDEVTYPEGET_NUC 18. DS_DVIO_PHYDEVTYPEGET_NUC 19. DS_DVIO_LINKCOMMUNICATION_NUC 20. DS_DVIO_PHYCOMMUNICATION_NUC 21.DS_PSCAN_COMMUNICATIONDENC_NUC 22.DS_PSCAN_COMMUNICATIONDEINTERLACER_NUC 23. DS_BE_COMMUNICATIONECHO_NUC 24.DS_ANAB_COMMUNICATIONIICNVRAM_NUC 25.DS_ANAB_COMMUNICATIONIICTUNER_NUC 26.DS_ANAB_COMMUNICATIONIICSOUNDPROCESSOR_NUC 27.DS_ANAB_COMMUNICATIONIICAVSELECTOR_NUC 28. DS_ANAB_CHECKSUMPROGRAM_NUC

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5.2 Player Script Interface

5.2.1 Trade Mode

TRADE MODE

When the recorder is in Trade Mode, the recorder cannot be controlled by means of the front key buttons, but only by means of the remote control.

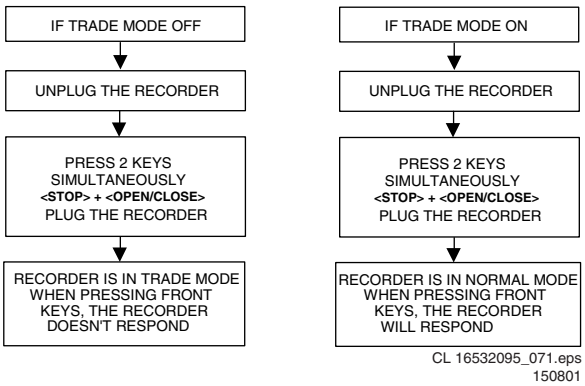
IF TRADE MODE OFF
UNPLUG THE RECORDER
PRESS 2 KEYS SIMULTANEOUSLY <STOP> + <OPEN/CLOSE> PLUG THE RECORDER
RECORDER IS IN TRADE MODE WHEN PRESSING FRONT KEYS, THE RECORDER DOESN'T RESPOND
IF TRADE MODE ON
UNPLUG THE RECORDER
PRESS 2 KEYS SIMULTANEOUSLY <STOP> + <OPEN/CLOSE> PLUG THE RECORDER
RECORDER IS IN NORMAL MODE WHEN PRESSING FRONT KEYS, THE RECORDER WILL RESPOND
CL 16532095_071.eps 150801

Figure 5-2

5.2.2 Virgin mode

If you want that the recorder starts up in Virgin mode, follow this procedure:

- Unplug the recorder
- plug the recorder again while you keep the STAND BY/ON key pressed
- the set starts up in Virgin mode.

5.3 Menu and Command Mode Interface

5.3.1 Nuclei Numeration

Each nucleus has a unique number of four digits. This number is the input of the command mode.

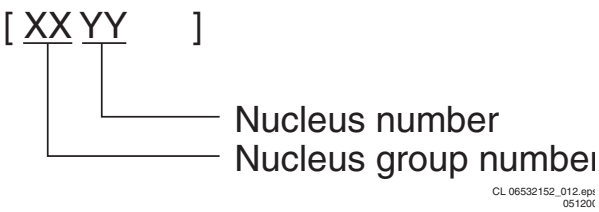

Figure 5-3

Group number	Group name
0	Scripts
1	Codec (e.g. Chrysalis, Leco)
2	Boot EEPROM
3	NVRAM
4	SDRAM
5	Flash
6	Video Input Processor
7	DVIO
8*	Progressive Scan
9	Basic Engine
10*	Display and Control Board
11*	Analogue Board
12	System
13*	Electronic Program Guide Board
14*	PCMCIA
15*	HDMI
16	Analogue Slave Processor
17	Analogue Board EEPROM
18	Video Matrix
19	Audio Matrix
20	Front End
21*	Hard Disk
22*	Digital Terrestrial Tuner Module

* Not applicable for DVDR610, DVDR615 & DVDR616 Range

5.3.2 Error Handling

Each nucleus returns an error code. This code contains six numerals, which means:

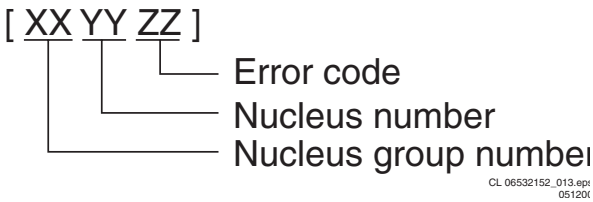

Figure 5-4

The nucleus group numbers and nucleus numbers are the same as above.

5.3.3 Command Mode Interface

Set-Up Physical Interface Components

Hardware required:

- Service PC
- one free COM port on the Service PC
- special cable to connect DVD recorder to Service PC

The service PC must have a terminal emulation program (e.g. Hyperterminal) installed and must have a free COM port (e.g. COM1). Activate the terminal emulation program and check that the port settings for the free COM port are: 19200 bps, 8 data bits, no parity, 1 stop bit and no flow control. The free COM port must be connected via a special cable to the RS232 port of the DVD recorder. This special cable will also connect the test pin, which is available on the connector, to ground (i.e. activate test pin).

Code number of PC interface cable: 3122 785 90017

Activation of Diagnostic Software

1. Pull the mains cord from the recorder and reconnect it again (reboot).
2. The next welcome message will appear on the PC:

Welcome screen D&S program

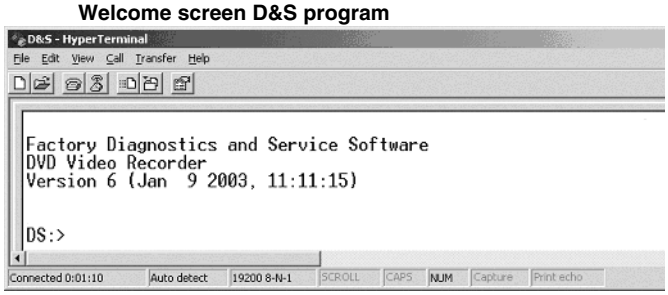

Figure 5-5

Now, the prompt 'DS:>' will appear. The diagnostic software is now ready to receive commands. The commands that can be given are the numbers of the nuclei. If you see above shown screen, continue with paragraph 'Nuclei Codes'.

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3. It is possible that the next messages will appear when starting the DVD+RW for the first time

Error messages D&S program

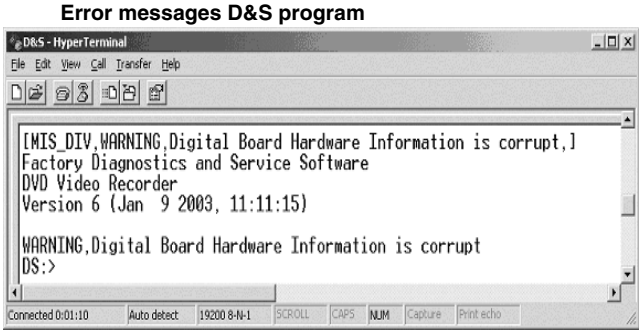

Figure 5-6a

Error messages D&S program

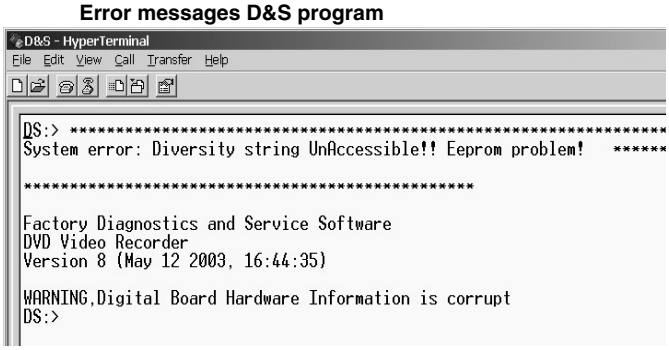
D&S - HyperTerminal
File Edit View Call Transfer Help
DS:> **********
System error: Diversity string UnAccessible!! Eeprom problem! ******
****
Factory Diagnostics and Service Software
DVD Video Recorder
Version 8 (May 12 2003, 16:44:35)
WARNING,Digital Board Hardware Information is corrupt
DS:>

Figure 5-6b

In these cases, the boot EEPROM of the Digital Board does not contain the required string with the hardware information. To update the Digital Board with the correct string, nucleus 1226 must be executed.

See next section 'Diversity String Input'.
There can also be the next error message.

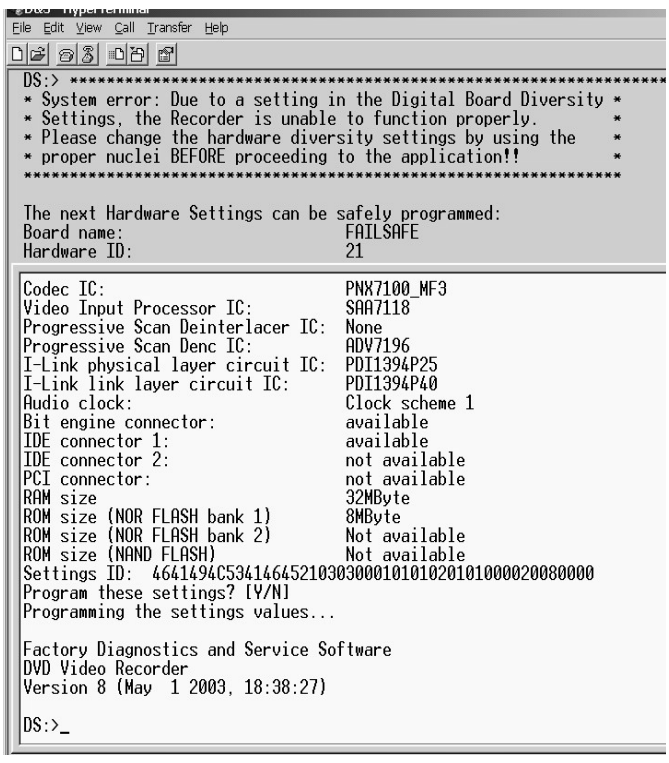
File Edit View Call Transfer Help
DS:> **********
* System error: Due to a setting in the Digital Board Diversity *
* Settings, the Recorder is unable to function properly. *
* Please change the hardware diversity settings by using the *
* proper nuclei BEFORE proceeding to the application!! *
****
The next Hardware Settings can be safely programmed:
Board name: FAILSAFE
Hardware ID: 21
Codec IC: PNX7100_MF3
Video Input Processor IC: SAA7118
Progressive Scan Deinterlacer IC: None
Progressive Scan Denc IC: ADV7196
I-Link physical layer circuit IC: PDI1394P25
I-Link link layer circuit IC: PDI1394P40
Audio clock: Clock scheme 1
Bit engine connector: available
IDE connector 1: available
IDE connector 2: not available
PCI connector: not available
RAM size 32MByte
ROM size (NOR FLASH bank 1) 8MByte
ROM size (NOR FLASH bank 2) Not available
ROM size (NAND FLASH) Not available
Settings ID: 4641494C53414645210303000101010201010000020080000
Program these settings? [Y/N]
Programming the settings values...
Factory Diagnostics and Service Software
DVD Video Recorder
Version 8 (May 1 2003, 18:38:27)
DS:>

Figure 5-6c

Enter "Y" to program a safe string. With this automatically generated string the board will work in principle but it has to be checked if all board settings were detected correctly.

Diversity String Input

4. Execute nucleus 1226 to enter the string. Please see chapter 8.4 for details

Nucleus 1226 execution with string

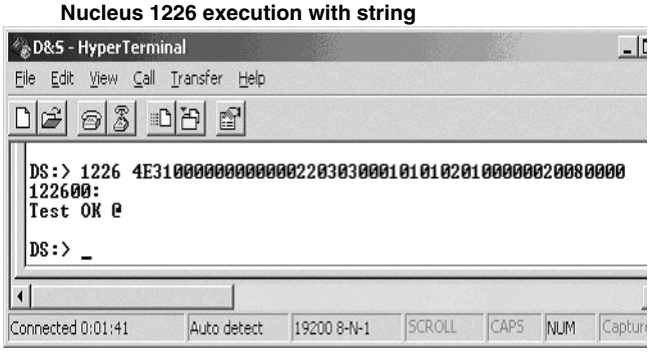

Figure 5-7

5. To check if the hardware info is filled correctly, you can execute nucleus 1228.

Nucleus 1228 info example

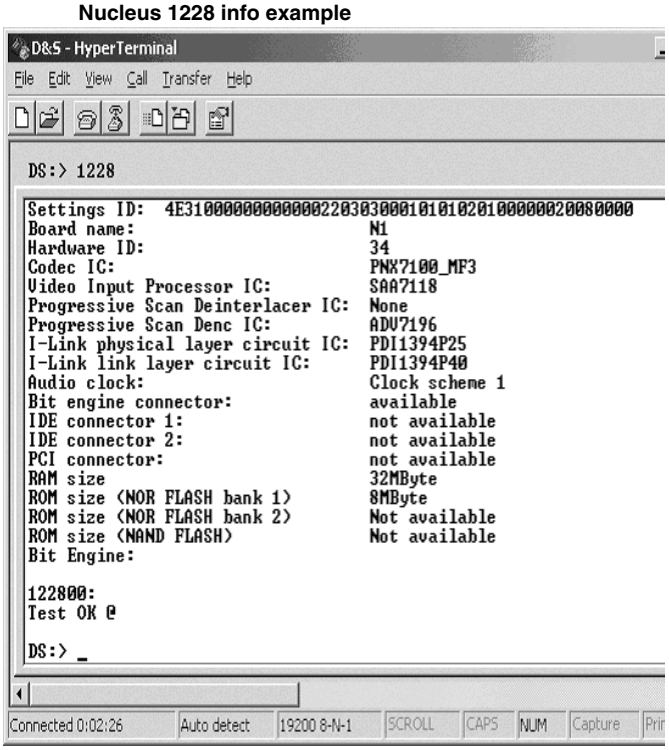

Figure 5-8

6. Exit the 'Terminal' program.

7. Reboot the DVD recorder to allow the software to start.

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Command overview Digital Board

Below you will find an overview of the nuclei, their numbers, and their error codes. This overview is preliminary and subject to modifications.

Note: AV3 in the overview includes also the AV3.5 drive.

CODEC HOST CONTROLLER (CHR)

Nucleus Name	**DS_CHR_DevTypeGet**		
Nucleus Number	100		
Description	Retrieves the device id, the module ids and revisions of the Codec and returns them to the stdout port.		
Technical	- Determine the codec id by means of comparing version ids of the modules.- Read the module-id register of every module and display it to the user.		
Execution Time	Less than 1 second.		
User Input	None		
Error	Number	Description	
	10000	Getting the information succeeded	
	10001	Wrong codec id detected	
Example	DS:> 100 010000: Device ID 7100 Codec ID PNX7100_C F-BCU (0x0102) 1.0 INTC (0x011d) 1.0 PCI-XIO(0x0113) 1.0 SIF (0x013b) 1.0 EJTAG (0x0104) 0.1 S-BCU (0x0102) 1.0 (0x010a) 1.0 CONFIG (0x013f) 1.1 RESET (0x0123) 1.0 DEBUG (0x0116) 0.0 UART0 (0x0107) 0.1 UART1 (0x0107) 0.1 UART2 (0x0107) 0.1 UART3 (0x0107) 0.1 I2C0 (0x0105) 0.1 I2C1 (0x0105) 0.1 GPIO (0x013c) 1.0 SYNC (0x013a) 1.0 DISP0 (0xa015) 1.12 DISP1 (0xa00f) 1.1 OSD (0x0136) 0.1 SPU (0xa00e) 0.0 MIXER (0x0137) 1.0 DENC (0x0138) 1.0 CCIR (0x0139) 1.0 VDEC (0x0133) 0.2 PARSER (0xa00d) 0.0 DV (0xa00c) 0.0 BEI (0xa00a) 0.1 IDE (0xa009) 0.1 SGDX (0xa008) 1.0 BYTE (0xa00b) 0.1 OUTPUT (0xa003) 1.0 ACOMP (0xa000) 1.0 VFE (0xa001) 0.1 VCOMP (0xa002) 1.0 SCR (0x0000) 0.0 SIFF (0xa011) 0.1 WMD (0xa010) 0.0 AUDIO0 (0xa015) 1.12 AUDIO1 (0xa00f) 1.1 PSCAN (0xa018) 0.1 Test OK @		

Nucleus Name	**DS_CHR_TestImageOn**
Nucleus Number	101
Description	Generates a test-image of a selected video standard on selected video output on the digital board. When no input is given, the default values will be used (see user input description below). Make sure to use the proper nuclei to route the video signal on the analogue board to get the videosignal to the proper output.
Technical	-Validate the user input. -Initialise the SYNC module. -Initialise the DISPLAY module. -Initialise the MIXER module. -Initialise the DENC module. -Set the selected video standard. -Generate the selected test image in memory. -Start the DISPLAY module. -Start the MIXER module. -Start the DENC module according to the selected test image id.
Execution Time	6 seconds.

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Nucleus Name	**DS_CHR_TestImageOn**	
User Input	The user has to decide which test image, video standard and video output must be used: Test image id: 0 VERTICAL_COLOURBAR (default) 1 HORIZONTAL_COLOURBAR 2 WHITE 3 YELLOW 4 CYAN 5 GREEN 6 MAGENTA 7 RED 8 BLUE 9 BLACK 10GRAY 11TEST_IMAGE_FOR_PROGRESSIVE_SCAN Video standard: PAL (default) NTSC Video output ALL CVBS and YC and RGB (default) CVBS YC RGB YUV PSCAN progressive scan	
Error	Number	Description
	10100	Generating the test image succeeded.
	10101	Invalid input was provided.
	10102	The Codec SYNC-module cannot be initialised.
	10103	The Codec MIXER-module cannot be initialised.
	10104	The Codec VPP-module cannot be initialised.
	10105	The Codec DENC-module cannot be initialised.
	10106	The digital board hardware information is corrupt
Example	DS:> 101 010100: Test OK @ DS:> 101 0 pal cvbs 010100: Test OK @ DS:> 101 4 ntsc yc 010100: Test OK @	

Nucleus Name	**DS_CHR_TestImageOff**	
Nucleus Number	102	
Description	Switches the test-image off.	
Technical	- Stop the DENC module.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10200	Stopping the test image generation succeeded
	10201	The Codec DENC-module failed.
Example	DS:> 102 010200: Test OK @	

Nucleus Name	**DS_CHR_SineOn**
Nucleus Number	103
Description	Generate an audio sine signal on the audio output of the digital board. Note: Left channel 6kHz, right channel 12 kHz sine. Make sure to route the signal first.

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Technical	- De-mute the analogue board - Set fifo parameters for audio - Set the volume - Set the I2S outputs and configuration paths - Set the decoder mode - Configure the audio decoder - Put the AC3 audio in the fifo - Send 'prepare' command to the audio decoder - Send 'play' command to the audio decoder	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	10300	The sine signal was successfully generated
	10301	The analogue board could not be de-muted
	10302	The audio decoder did not initialise
	10303	The dsp2 of the audio decoder did not configure
	10304	The dsp1 of the audio decoder did not configure
	10305	There was a delay-error before starting
	10306	Wrong input was given to the decoder function
	10307	Wrong input was given to the decoder function @@@@@
	10308	The audio decoder did not get into the 'prepared' state
Example	DS:> 103 010300: Test OK @	

Nucleus Name	**DS_CHR_SineOff**	
Nucleus Number	104	
Description	Stop generating the audio sine signal	
Technical	- Reset the audio block of the Codec	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10400	Switching off the audio sine signal succeeded
	10401	Failed to reset the audio decoder
Example	DS:> 104 010400: Test OK @	

Nucleus Name	**DS_CHR_SineBurst**	
Nucleus Number	105	
Description	Generate an audio sine signal on the audio output of the digital board for 4 seconds. Note: Left channel 6kHz, right channel 12 kHz sine with some known hick-ups	
Technical	- Call the DS_CHR_SineOn nucleus - Delay for 4 seconds - Call the DS_CHR_SineOff nucleus	
Execution Time	4 seconds	
User Input	None	
Error	Number	Description
	10500	The sine signal burst was successfully generated
	10501	The delay did not succeed during the burst
	10502	The audio sine could not be generated
Example	DS:> 105 010500: Test OK @	

Nucleus Name	**DS_CHR_MuteOn**	
Nucleus Number	106	
Description	Mute the audio outputs of the digital board	
Technical	- Send the 'Mute' command to the audio decoder	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10600	Muting the audio succeeded

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Example	DS:> 106 010600: Test OK @

Nucleus Name	**DS_CHR_MuteOff**	
Nucleus Number	107	
Description	De-mute the audio outputs of the digital board	
Technical	- Send the 'DeMute' command to the audio decoder	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10700	De-muting the audio succeeded
Example	DS:> 107 010700: Test OK @	

Nucleus Name	**DS_CHR_DvLedOn**	
Nucleus Number	108	
Description	Check the connection to the DV-LED on the digital board by switching it on	
Technical	- Write to the PIO pin to light the DV LED	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10800	Switching the DV-LED on succeeded
	10801	Switching the DV-LED on failed
Example	DS:> 108 010800: Test OK @	

Nucleus Name	**DS_CHR_DvLedOff**	
Nucleus Number	109	
Description	Switch off the DV-LED on the digital board	
Technical	- Write to the PIO pin to switch off the DV LED	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	10900	Switching the DV-LED off succeeded
	10901	Switching the DV-LED off failed
Example	DS:> 109 010900: Test OK @	

Nucleus Name	**DS_CHR_MacroVisionOn**	
Nucleus Number	110	
Description	Turn on MacroVision.	
Technical	- Set some registers of the DENC module in the Codec.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	11000	Turning on MacroVision succeeded
	11001	Turning on MacroVision failed
Example	DS:> 110 011000: Test OK @	

Nucleus Name	**DS_CHR_MacroVisionOff**	
Nucleus Number	111	
Description	Turn off MacroVision.	
Technical	- Set some registers of the DENC module in the Codec.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	11100	Turning off MacroVision succeeded

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	11101	Turning off MacroVision failed
Example	DS:> 111 011100: Test OK @	

Nucleus Name	**DS_CHR_Peek**	
Nucleus Number	112	
Description	Peek a value on a specified address	
Technical	- Check the user input - Read out the address specified - Check whether the address to be read is aligned on 4 bytes	
Execution Time	Less than 1 second.	
User Input	The address to peek on	
Error	Number	Description
	11200	Peeking on the specified address succeeded
	11201	Peeking on the specified address failed, wrong user input
	11202	Peeking on the specified address failed due to misalignment
Example	DS:> 112 0xa0700000 011200: Value read = 0x000001BD Test OK @	

Nucleus Name	**DS_CHR_Poke**	
Nucleus Number	113	
Description	Poke a value on a specified address	
Technical	- Check the user input - Change the value on the address specified - Check whether the address to be modified is aligned on 4 bytes	
Execution Time	Less than 1 second.	
User Input	The address to poke and the value: <address><value>	
Error	Number	Description
	11300	Poking the specified address succeeded
	11301	Poking the specified address failed, wrong user input
	11302	Poking the specified address failed due to misalignment
Example	DS:> 113 0xa0700000 0xaabbccdd 011300: Test OK @	

Nucleus Name	**DS_CHR_INT_PICInterrupts**	
Nucleus Number	114	
Description	Test all interrupts of the priority interrupt controller	
Technical	- Install interrupt handlers - Generate interrupts - Test whether all interrupts were received	
Execution Time	Less than 1 second.	
User Input	-	
Error	Number	Description
	11400	Testing all the PIC interrupts succeeded
	11401	Testing all the PIC interrupts failed
Example	DS:> 114 011400: Test OK @	

Nucleus Name	**DS_CHR_DMA_TestDMA**	
Nucleus Number	115	
Description	Test the memory to memory DMA transfer	
Technical	- Create a block with known data in memory - Copy this block to the consecutive area using 3 different DMAs - Check whether all DMAs transferred the data properly	
Execution Time	Less than 2 seconds.	
User Input	-	
Error	Number	Description
	11500	The testing of the DMAs succeeded
	11501	The initialisation of the DMAs failed for one or more DMA
	11502	One or more DMAs failed the test

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Example	DS:> 115 011500: Test OK @

Boot EEPROM (BROM)

Nucleus Name	**DS_BROM_Communication**	
Nucleus Number	200	
Description	Check the communication between the IIC controller of the Chrysalis and the boot EEPROM	
Technical	- Initialise IIC - Read something from the EEPROM	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	20000	The data is properly read so the communication is OK
	20001	The IIC bus was not accessible
	20002	There was a timeout reading the device
	20003	The IIC acknowledge was not received
	20004	An IIC-bus error occurred
	20005	The IIC bus initialisation failed
	20006	An unexpected IIC error occurred
Example	DS:> 200 020000: Test OK @	

Nucleus Name	**DS_BROM_WriteRead**	
Nucleus Number	201	
Description	Check whether the Boot EEPROM can be written to and read from	
Technical	- Initialise IIC - Write something to the EEPROM - Read from the same location and check whether it is the same as written	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	20100	The write-read test succeeded
	20101	The write-read test failed
	20102	An IIC-bus error occurred
	20103	There was a timeout reading the device
	20104	The IIC bus was not accessible
	20105	The IIC acknowledge was not received
	20106	Got unknown IIC bus error
	20107	The IIC bus initialisation failed
Example	DS:> 201 020100: Test OK @	

NVRAM

Nucleus Name	**DS_NVRAM_Communication**	
Nucleus Number	300	
Description	Check the communication between the IIC controller of the Codec and the EEPROM	
Technical	- Initialise IIC - Read from a location in NVRAM	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	30000	Something is properly read so the communication is OK
	30001	The IIC bus was not accessible
	30002	There was a timeout reading the device
	30003	The IIC acknowledge was not received
	30004	The communication with the device failed
	30005	The IIC bus initialisation failed
	30006	@@@@@@

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Example	DS:> 300 030000: Test OK @

Nucleus Name	**DS_NVRAM_WriteRead**	
Nucleus Number	301	
Description	Check whether the EEPROM can be written to and read from	
Technical	- Initialise IIC - Backup data from location to modify - Write to location and read it back again - Write back the backed up data to the location to leave the NVRAM as found	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	30100	The write-read test succeeded
	30101	The IIC bus could not be initialised
	30102	There was an NVRAM IO error
	30103	The value could not be read back from the NVRAM
Example	DS:> 301 030100: Test OK @	

Nucleus Name	**DS_NVRAM_Clear**	
Nucleus Number	302	
Description	Make the EEPROM empty, containing all zeroes.	
Technical	- Initialise IIC - Create a memory block filled with zeroes - Write this block to the NVRAM	
Execution Time	16 seconds	
User Input	None	
Error	Number	Description
	30200	The clearing of the NVRAM succeeded
	30201	There was an IIC error
	30202	Clearing the NVRAM failed
Example	DS:> 302 030200: Test OK @	

Nucleus Name	**DS_NVRAM_Modify**	
Nucleus Number	303	
Description	Modifies one or more locations in NVRAM and updates the checksum of the section modified	
Technical	- Initialise IIC - Decode user input - Modify the NVRAM as indicated - Validate the NVRAM by calculating the checksum and storing it	
Execution Time	Less than 1 second	
User Input	1. The location that must be modified i.e. "ALL" "BOOT" "DIAGNOSTICS" "DOWNLOAD" "CONFIG" "RECORDER" or no string if an offset from the base address of the NVRAM is required 2. The offset and data which to put on the selected location <offset> <length> <data>	
Error	Number	Description
	30300	Modifying the NVRAM contents succeeded
	30301	Unable to initialise NVM
	30302	Modifying the NVRAM contents failed
	30303	length out of range
	30304	unable to decode length
	30305	offset out of range
	30306	unable to decode offset
	30307	unknown location specified
	30308	no location is specified
	30309	number of values incorrect
	30310	There was an IIC error

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Example	DS:> 303 DIAGNOSTICS 5 1 0x5a 030300: Section is modified successfully Test OK @

Nucleus Name	**DS_NVRAM_Read**	
Nucleus Number	304	
Description	Read out one or more locations in the NVRAM	
Technical	- Initialise IIC - Decode user input - Read from the NVRAM and return this info to the user	
Execution Time	Less than 1 second	
User Input	1. The location which must be read i.e. "ALL" "BOOT" "DIAGNOSTICS" "DOWN LOAD" "CONFIG" "RECORDER" or no string if an offset from the base address of the NVRAM is required 2. The offset and number of bytes to read <offset> <length>	
Error	Number	Description
	30400	Value read
	30401	Unable to initialise NVM
	30402	Reading the NVRAM contents failed
	30403	length out of range
	30404	unable to decode length
	30405	offset out of range
	30406	unable to decode offset
	30407	unknown location specified
	30408	no location is specified
Example	304 DIAGNOSTICS 0 6 030400: Value read = 0x00 0x00 0x00 0x00 0x00 0x5A Test OK @	

SDRAM

Nucleus Name	**DS_SDRAM_WriteRead**	
Nucleus Number	400	
Description	Check all data lines, address lines and memory locations of the SDRAM	
Technical	- Test the databus - Test the address bus - Test the integrity of the device itself (memory locations)	
Execution Time	11 seconds for 32 Mb 23 seconds for 64 Mb	
User Input	None	
Error	Number	Description
	40000	The write-read test succeeded
	40001	The data bus contains an error
	40002	The address bus contains an error
	40003	The SDRAM itself contains an error
Example	DS:> 400 040000: Test OK @	

Nucleus Name	**DS_SDRAM_WriteReadFast**	
Nucleus Number	401	
Description	Check all data lines and address lines of the SDRAM	
Technical	- Test the databus - Test the addressbus	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	40100	The write-read test succeeded
	40101	The data bus contains an error
	40102	The address bus contains an error
Example	DS:> 401 040100: Test OK @	

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Nucleus Name	**DS_SDRAM_Write**	
Nucleus Number	402	
Description	Write to a specific memory address	
Technical	- Decode the user input and check its ranges and alignment on 4 bytes - Write the data to the SDRAM	
Execution Time	Less than 1 second	
User Input	1. The location that must be modified (SDRAM starts at address 0xA0000000) 2. The value to put on the selected location	
Error	Number	Description
	40200	Writing to the SDRAM succeeded
	40201	Writing to the SDRAM failed; Wrong user input
	40202	Address is not dividable by 4
Example	DS:> 402 0xa1000010 0xad112222 040200: Test OK @	

Nucleus Name	**DS_SDRAM_Read**	
Nucleus Number	403	
Description	Read from a specific memory address	
Technical	- Decode the user input and check the ranges - Read from the SDRAM and return this info to the user	
Execution Time	Less than 1 second	
User Input	The location from which the data must be read (SDRAM starts at address 0xA0000000)	
Error	Number	Description
	40300	Reading from the SDRAM succeeded
	40301	Reading from the SDRAM failed; Wrong user input
	40302	Address is not dividable by 4
Example	DS:> 403 0xa1000010 040300: Value read = 0xAD112222 Test OK @	

FLASH

Nucleus Name	**DS_FLASH_DevTypeGet**	
Nucleus Number	500	
Description	Get the device (revision) type information of the FLASH IC. (type, manufacturer, device ID and size)	
Technical	- Set the timing for the flash writing - Write a command sequence to determine device type information - Return the information to the user	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	50000	Getting the information from the FLASH succeeded
	50001	Getting the information from the FLASH failed
Example	DS:> 500 050000: Found FLASH memory: NOR AMD 29DL640G 8MB,NOR AMD 29DL640G 8MB Test OK @	

Nucleus Name	**DS_FLASH_WriteRead**	
Nucleus Number	501	
Description	Check whether the FLASH can be written to and read from	
Technical	- Find the test segment in flash - Read the data into SDRAM - Modify the data - Write this data from SDRAM to FLASH and verify it by reading back again	
Execution Time	Less than 1 seconds.	
User Input	None	
Error	Number	Description
	50100	The FLASH write-read test succeeded
	50101	The test segment could not be found
	50102	All bits is the TEST region are filled with 0 (region exhausted)

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	50103	The WriteRead test failed
	50104	The Write Failed
Example	DS:> 501 050100: Test OK @	

Nucleus Name	**DS_FLASH_Read**	
Nucleus Number	502	
Description	Read from a specific memory address in FLASH	
Technical	- Decode the user input and check the ranges and whether the address is aligned on 4 bytes - Read the data and return this to the user	
Execution Time	Less than 1 seconds.	
User Input	The location from which data must be read (FLASH starts at address 0xB8000000)	
Error	Number	Description
	50200	Reading the FLASH succeeded
	50201	Reading the FLASH failed; Wrong user input
	50202	Address is not dividable by 4
Example	DS:> 502 0xb8000000 050200: Value read = 0x3C08A000 Test OK @	

Nucleus Name	**DS_FLASH_ChecksumProgram**	
Nucleus Number	503	
Description	Check the checksum of the application partitions by recalculating and comparing partition checksums	
Technical	- Determine the number of segments - Find the application in each segment and determine its checksum - Check whether the checksums stored match the newly calculated	
Execution Time	6 seconds	
User Input	None	
Error	Number	Description
	50300	The checksum is valid, the test succeeded
	50301	The checksum is invalid
Example	DS:> 503 050300: BootCode checksum is: 0xBABE5B6F, which is correct Diagnostics checksum is : 0xBABEBAFF, which is correct Download checksum is: 0xBABEEDBF, which is correct Application checksum is : 0xBABE8EEC, which is correct Test OK @	

Nucleus Name	**DS_FLASH_CalculateChecksum**	
Nucleus Number	504	
Description	Calculate the checksum over all memory addresses. Used to check entire FLASH contents	
Technical	- Run the checksum calculation algorithm all flash memory addresses	
Execution Time	6 seconds	
User Input	None	
Error	Number	Description
	50400	Calculating the checksum over all addresses succeeded
Example	DS:> 504 050400: The Checksum = 0xBABE30A4 Test OK @	

Nucleus Name	**DS_FLASH_CalculateChecksumFast**	
Nucleus Number	505	
Description	Calculate a checksum over a selected number of address locations	
Technical	- Run the checksum calculation algorithm on a selected number of flash memory addresses	
Execution Time	6 seconds	
User Input	None	
Error	Number	Description
	50500	Calculating the checksum over selected addresses succeeded

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Example	DS:> 505 050500: The Checksum = 0xBABEB064 Test OK @

Video Input Processor (VIP)

Nucleus Name	**DS_VIP_DevTypeGet**	
Nucleus Number	600	
Description	Get the device (revision) type information of the VIP IC	
Technical	- Initialise IIC - Read out the device (revision) type information of the VIP IC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	60000	Getting the information from the VIP succeeded
	60001	The IIC bus initialisation failed
	60002	The was an error getting the information from the VIP
	60003	Type not according to type stored in HW diversity string
Example	DS:> 600 060000: Found SAA7118 Test OK @	

Nucleus Name	**DS_VIP_Communication**	
Nucleus Number	601	
Description	Check the communication between the IIC controller of the Codec and the VIP IC	
Technical	- Initialise IIC - Read data from a location in the VIP	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	60100	Communicating with the VIP succeeded
	60101	The IIC bus was not accessible
	60102	There was a timeout reading the device
	60103	The IIC acknowledge was not received
	60104	The communication with the device failed
	60105	The IIC bus initialisation failed
Example	DS:> 601 060100: Test OK @	

Nucleus Name	**DS_VIP_ClockOutputOn**	
Nucleus Number	602	
Description	Switch the clock output on	
Technical	- Initialise IIC - Set the clock output through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	60200	Switching the clock output on succeeded
	60201	Switching the clock output on failed
Example	DS:> 602 060200: Test OK @	

Nucleus Name	**DS_VIP_ClockOutputOff**	
Nucleus Number	603	
Description	Switch the clock output off	
Technical	- Initialise IIC - Reset the clock output through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	60300	Switching the clock output off succeeded
	60301	Switching the clock output off failed

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Example	DS:> 603 060300: Test OK @

Nucleus Name	**DS_VIP_SelectInput**	
Nucleus Number	604	
Description	Select an input video path to be switched to the analogue output pin (AOUT) of the VIP	
Technical	- Check the user input - Initialise IIC - Read out the VIP id - Write the set of registers required for the input specified	
Execution Time	Less than 1 second	
User Input	The input to select, see table below.	
Error	Number	Description
	60400	Selecting the input of the VIP succeeded
	60401	The user provided wrong input
	60402	The VIP was not accessible
	60402	An unsupported VIP was found
Example	DS:> 604 1 060400: Test OK @	

Table 5-1 *Available channels for input of the 7118 and their description*

Channel number	Description
1	CVBS_Y_IN_A
2	CVBS_OUT_B
3	CVBS_Y_IN_B
4	CVBS_Y_IN_C
6	C_IN
8	G_IN
9	Y_IN
13	B_IN
14	U_IN
18	R_IN
19	V_IN

Table 5-2 *Available channels for input of the 7115 and their description*

Channel number	Description
1	CVBS_Y_IN_B
2	CVBS_OUT_B_VIP
4	C_IN_VIP
7	CVBS_Y_IN_B

Digital Video Input Output (DVIO)

Nucleus Name	**DS_DVIO_LinkDevTypeGet**	
Nucleus Number	700	
Description	Get the device (revision) type information of the 1394 Link layer IC	
Technical	- Initialise the PIO pins on the Codec - Read out the ID register	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	70000	Getting the information from the link layer IC succeeded
	70001	Getting the information from the link layer IC failed
	70002	Type not according to type stored in HW diversity string
Example	DS:> 700 070000: Device type of the link layer IC: ffc00301 Test OK @	

Nucleus Name	**DS_DVIO_PhyDevTypeGet**
Nucleus Number	701

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Description	Get the device (revision) type information of the 1394 Physical layer IC
Technical	- Initialise the PIO pins of the Codec-Write the PHY - access register in the Link chip to indicate phy read access - Wait until the link chip has obtained the value from the phy-chip - Read this out and filter the data to be returned to the user
Execution Time	Less than 1 second
User Input	None
Example	DS:> 701 070100: Physical layer IC: VendorID: 0x006037, ProductID: 0x412801 Test OK @

Nucleus Name	**DS_DVIO_LinkCommunication**	
Nucleus Number	702	
Description	Check the accessibility of the 1394 Link layer IC by writing to and reading from a specific address	
Technical	- Initialise the PIO pins of the chrysalis - Write a pattern to the CYCTM register of the link chip - Read back and verify the pattern	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	70200	Communicating with the link layer IC succeeded
	70201	Communicating with the link layer IC failed
	70202	Result of nucleus not according to HW diversity string
Example	DS:> 702 070200: Test OK @	

Nucleus Name	**DS_DVIO_PhyCommunication**	
Nucleus Number	703	
Description	Check the accessibility of the 1394 Physical layer IC by writing to and reading from a specific address	
Technical	- Initialise the PIO pins of the Codec - Initialise IIC - Write the data to be written to the phy-chip to the link chip first - Wait until the link chip indicates that the data has been written to the PHY - Write the PHY-access register in the Link chip to indicate PHY read access - Wait until the link chip has obtained the value from the PHY-chip - Test whether the value read back equals the one previously written	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	70300	Communicating with the physical layer IC succeeded
	70301	The physical layer IC was not accessible
	70302	Communicating with the physical layer IC failed
	70303	Result of nucleus not according to HW diversity string
Example	DS:> 703 070300: Test OK @	

Nucleus Name	**DS_DVIO_Routing**
Nucleus Number	704
Description	Route a DV stream containing an audio and video signal through the physical and link layer ICs to the Codec. This test works for both NTSC and PAL.
Technical	- Initialise the DMA to transfer 5 frames PAL/NTSC - Initialise the DV demultiplexer - Initialise the 1394 interface and start reception of the DV stream - Check whether the stream was copied to memory properly by the byte input interface (port to memory type DMA)
Execution Time	6-10 seconds (6 when OK, 10 when no stream or error)
User Input	None

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Error	Number	Description
	70400	Routing the signals succeeded
	70401	The 1394 link chip could not be initialised properly
	70402	There was a syntax error in the DV stream
	70403	DMA could not copy DV stream to memory. Stream connected?
	70404	DMA not working properly
Example	DS:> 704 070400: Test OK @	

Nucleus Name	**DS_DVIO_DetectNode**	
Nucleus Number	705	
Description	Check whether a DV node can be detected by the hardware. This test works for both NTSC and PAL.	
Technical	- Initialise the 1394 interface - Detect whether a node is in range	
Execution Time	3 or 5 seconds (3 when OK, 5 when no stream or error)	
User Input	None	
Error	Number	Description
	70500	The node was detected OK
	70501	The 1394 link chip could not be initialised properly
	70502	Unable to write to 1394 PHY chip
	70503	Unable to read from 1394 PHY chip
	70504	No node was detected
Example	DS:> 705 070500: Test OK @	

Nucleus Name	**DS_DVIO_DetectStream**	
Nucleus Number	706	
Description	Check whether a DV stream can be detected by the hardware. This test works for both NTSC and PAL.	
Technical	- Initialise the 1394 interface - Start receiving the stream - Detect whether the stream is OK	
Execution Time	3 or 5 seconds (3 when OK, 5 when no stream or error)	
User Input	None	
Error	Number	Description
	70600	The stream was detected
	70601	The 1394 link chip could not be initialised properly
	70602	No stream detected
Example	DS:> 706 070600: Test OK @	

Progressive Scan (PSCAN)

Nucleus Name	**DS_PSCAN_DencDevTypeGet**	
Nucleus Number	800	
Description	Retrieve the device type information from the progressive scan DENC IC	
Technical	-	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	80000	Retrieving the device type information succeeded
	80001	The IIC bus was not accessible
	80002	There was a timeout reading the device
	80003	The IIC acknowledge was not received
	80004	Communicating with the progressive scan DENC-IC failed
	80005	The initialisation of the IIC bus failed
Example	DS:> 800 080000: Device Type xxxx t.b.d. Test OK @	

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Nucleus Name	**DS_PSCAN_CommunicationDenc**	
Nucleus Number	801	
Description	Check the communication between the IIC controller of the chrysalis and the progressive scan DENC-IC	
Technical	- Initialise IIC - Write data to a register of the DENC through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	80100	Communicating with the progressive scan DENC-IC succeeded
	80101	The IIC bus was not accessible
	80102	There was a timeout reading the device
	80103	The IIC acknowledge was not received
	80104	Communicating with the progressive scan DENC-IC failed
	80105	The initialisation of the IIC bus failed
	80106	The read data is not the same as the written data
	80107	No chip was expected
Example	DS:> 801 080100: Test OK @	

Nucleus Name	**DS_PSCAN_TestImageOn**	
Nucleus Number	802	
Description	Generate the test images that are present on the progressive scan IC.	
Technical	- Determine whether the user wanted a HATCH or a FRAME image pattern - Initialise the PIO pins of the Codec - Initialise IIC - Reset the DENC - Enable the 27Mhz clock - Send all settings for the pattern to the DENC through IIC	
Execution Time	Less than 1 second	
User Input	In case of ADV7196: When no input is given “HATCH” is the default -“HATCH” -“FRAME” Remark: “HATCH” is a crosshatch test pattern (horizontal and vertical white lines are displayed against a black background) “FRAME” is a uniform coloured frame/field test pattern (default white). In case of FLI2300: Nothing.	
Error	Number	Description
	80200	The generation of the test image succeeded
	80201	Unable to initialise PSCAN IC
	80202	Unable to reset DENC
	80203	Unable to generate image
	80204	No chip was expected
Example	DS:> 802 HATCH 080200: Test OK @	

Nucleus Name	**DS_PSCAN_TestImageOff**	
Nucleus Number	803	
Description	Switch off the generated test image	
Technical	- Initialise IIC - Send the default DENC settings to the DENC through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	80300	Turning off the test image succeeded
	80301	Unable to initialise PSCAN IC
	80302	IIC Error during writing PSCAN IC
	80303	No chip was expected

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Example	DS:> 803 080300: Test OK @

Nucleus Name	**DS_PSCAN_TestImageColourSettingsSet**	
Nucleus Number	804	
Description	Set the colour of the hatch- or the frame- field to a different value than the default white	
Technical	- Determine which colour must be set. - Initialise IIC. - Enable 27 Mhz PSCAN Clock. - Send all settings to the DENC through IIC.	
Execution Time	Less than 1 second.	
User Input	A colour string of one of the next non-case sensitive strings (WHITE, BLACK, RED, GREEN, BLUE, YELLOW, CYAN, MAGENTA) or Y Cr Cb (hexa-) decimal values.	
Error	Number	Description
	80400	Setting the new colour-settings succeeded
	80401	The user provided wrong input
	80402	Unable to initialise pscan ic
	80403	Unable to set colour
	80404	No chip was expected
Example	DS:> 804 yellow 080400: Test OK @ DS:> 804 0x6a 0xde 0xca 080400: Test OK @	

Nucleus Name	**DS_PSCAN_TestImageColourSettingsGet**	
Nucleus Number	805	
Description	Get the colour settings of the hatch- or the frame- field.	
Technical	- Initialise IIC. - Read the colour settings from the DENC through IIC.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	80500	Getting the colour-settings succeeded
	80501	The progressive scan DENC-IC was not accessible through IIC
	80502	Unable to get colour
	80503	No chip was expected
Example	DS:> 805 080500: Colour Y Cr Cb values: 0xD2 0x92 0x10 Test OK @	

Nucleus Name	**DS_PSCAN_Routing**	
Nucleus Number	806	
Description	Route a video signal from the codec host processor through the progressive scan ICs to the progressive scan output of the set. **Note:** To route the progressive scan to the output of the set, first call the nucleus to do the video routing on the analogue (part of the) board.	
Technical	- Initialise the PIO pins of the Codec - Initialise IIC - Reset the DENC - Enable the 27Mhz clock - Send all settings to the DENC through IIC.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	80600	Routing path is created successfully.
	80601	Unable to initialise the Codec.
	80602	Unable to access DENC
	80603	Unable to access de-interlacer.
	80604	Wrong chips were expected.
Example	DS:> 806 080600: Test OK @	

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Nucleus Name	**DS_PSCAN_DevTypeGetDeinterlacer**	
Nucleus Number	807	
Description	Get the device (revision) type information of the progressive scan de-interlacer.	
Technical	- Initialise the dei-nterlacer. - Read the version register of the de-interlacer.	
Execution Time	1 second	
User Input	None	
Error	Number	Description
	80700	Everything went well.
	80701	The communication with the device failed
	80702	No chip was expected
Example	DS:> 807 080700: Chip name : 2300 Chip version : 1 Test OK @	

Nucleus Name	**DS_PSCAN_CommunicationDeinterlacer**	
Nucleus Number	808	
Description	Check the communication between the IIC controller of the Codec and the progressive scan De-interlacer-IC	
Technical	- Initialise IIC - Set the video source synchronisation source to the Codec - Write data to the DENC through IIC	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	80800	Communicating with the progressive scan De-interlacer-IC succeeded
	80801	The IIC bus was not accessible
	80802	There was a timeout reading the device
	80803	The communication with the device failed (no ACK)
	80804	Communicating with the progressive scan De-interlacer-IC failed
	80805	The initialisation of the IIC bus failed
	80806	The data read back is not the same as the data written
	80807	No chip was expected
Example	DS:> 808 080800: Test OK @	

Basic Engine (BE)

Nucleus Name	**DS_BE_CommunicationEcho**	
Nucleus Number	900	
Description	Check the communication between the digital board and the basic engine by issuing an *echo* command	
Technical	- Send the ECHO command - Check if the BE returned the string 0x00 0xAA 0x55	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	90000	Communicating with the BE over the S2B interface succeeded
	90001	There was a time-out while communicating
	90002	The Basic Engine returned an unexpected result
	90003	The Basic Engine returned an error code
	90004	No acknowledge received from BE
	90005	Communicating with the Basic Engine failed
	90006	Echo check failed, no echo received
	90007	Echo check failed, received wrong pattern
Example	DS:> 900 090000: Test OK @	

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Nucleus Name	**DS_BE_Reset**	
Nucleus Number	901	
Description	Reset the basic engine	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Toggle the reset pin of the I2S interface - In case of an AV3 Toggle the reset pin of the IDE interface	
Execution Time	2 seconds on AV2 9 seconds on AV3 (when disc inside)	
User Input	None	
Error	Number	Description
	90100	Resetting the Basic Engine succeeded
	90101	Resetting the Basic Engine failed
Example	DS:> 901 090100: Test OK @	

Nucleus Name	**DS_BE_GetSelftestResult**	
Nucleus Number	902	
Description	Return the self-test results through the service port	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the S2B GET_SELF_TEST_RESULT command - In case of an AV3 Send the ATAPI REPORT_DRIVE_DIAGNOSTICS command - On error display the specific error codes received from the BE	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	90200	Self test succeeded, no errors
	90201	There was a time-out while communicating
	90202	The Basic Engine returned an unexpected result
	90203	The BE returned an error code
	90204	No acknowledge received from BE
	90205	Communicating with the Basic Engine failed
	90206	Basic Engine returned no info
	90207	Self test failed, errors are echoed
Example	DS:> 902 090200: Self-test result byte : 00000000 Self-test result byte : 00000000 Self-test result byte : 00000000 Test OK @	

Nucleus Name	**DS_BE_VersionGet**	
Nucleus Number	903	
Description	Get the version of the basic engine and that of the optical unit	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 send the S2B GET_VERSION_NUMBER command - In case of an AV3 send the ATAPI INQUIRY command - Send the GET_OPU_VERSION command - Display the returned version information	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	90300	BE version OK
	90301	There was a time-out while communicating
	90302	The Basic Engine returned an unexpected result
	90303	The BE returned an error code
	90304	No acknowledge received from BE
	90305	Communicating with the Basic Engine failed
	90306	The BE returned no info
Example	DS:> 903 090300: BE version = 31.30.24. PHILIPS ,VAD8031 ,31302400,REL_8031_313024 2073, Optical unit version = 00.06.82.19.00 Test OK @	

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Nucleus Name	**DS_BE_TrayOut**	
Nucleus Number	904	
Description	Open the tray of the basic engine	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the S2B TRAY_OUT command - In case of an AV3 send an ATAPI START_STOP_UNIT command	
Execution Time	Approximately 2 seconds	
User Input	None	
Error	Number	Description
	90400	The command executed successfully
	90401	There was a time-out while communicating
	90402	The Basic Engine returned an unexpected result
	90403	The BE returned an error code
	90404	No acknowledge received from BE
	90405	Unable to enter normal mode
	90406	Communicating with the Basic Engine failed
Example	DS:> 904 090400: Test OK @	

Nucleus Name	**DS_BE_TrayIn**	
Nucleus Number	905	
Description	Close the tray of the basic engine	
Technical	- Check if an AV2 or AV3 is connected - Send the S2B TRAY_IN command - In case of an AV3 send an ATAPI START_STOP_UNIT command	
Execution Time	Approximately 1 - 2 seconds	
User Input	None	
Error	Number	Description
	90500	The command executed successfully
	90501	There was a time-out while communicating
	90502	The Basic Engine returned an unexpected result
	90503	The BE returned an error code
	90504	No acknowledge received from BE
	90505	Unable to enter normal mode
	90506	Communicating with the Basic Engine failed
Example	DS:> 905 090500: Test OK @	

Nucleus Name	**DS_BE_WriteReadDvdRw**
Nucleus Number	906
Description	Write data to and read data from a DVD+RW disc through the basic engine for verification of the writing
Technical	- Check if an AV2 or AV3 is connected - Execute DS_BE_GetSelftestResults - Send the TRAY_IN command - Send the READ_TOC command - Generate a random disc location - Generate test data to write to the DVD+RW - In case of an AV2 Transfer the test data to the disc location using DMA - In case of an AV3 Transfer the test data to the disc location using PIO mode ATAPI WRITE_10 - In case of an AV2 Read back the data from disc using DMA - In case of an AV3 Transfer the test data to the disc location using PIO mode ATAPI READ_10 - Compare the two data areas and check whether the areas are equal
Execution Time	Approximately 20 seconds
User Input	None

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Error	Number	Description
	90600	The command executed successfully
	90601	This nucleus cannot be executed because the Self-Test failed
	90602	The BE cannot enter normal operating mode
	90603	Unable to send the tray in
	90604	Unable to read TOC from disc
	90605	Invalid disc is loaded, please insert a DVD+RW disc
	90606	Writing the test pattern to DVD+RW failed
	90607	Reading back the test pattern from DVD+RW failed
	90608	Compare check failed
	90609	Calibrating DVD+RW failed
Example	DS:> 906 090600: Testing on sector 0x5dbe0: OK Test OK @	

Nucleus Name	**DS_BE_WriteReadDvdR**	
Nucleus Number	907	
Description	Write data to and read data from a DVD+R disc through the basic engine for verification of the writing	
Technical	- Check if an AV2 or AV3 is connected - Execute DS_BE_GetSelftestResults - Send the TRAY_IN command - Send the READ_TOC command - Use the OPC area to test if the DVD+R is (still) writable - Generate test data to write to the DVD+R - In case of an AV2 Transfer the test data to the disc location using DMA - In case of an AV3 Transfer the test data to the disc location using PIO mode ATAPI WRITE_10 - In case of an AV2 Read back the data from disc using DMA - In case of an AV3 Transfer the test data to the disc location using PIO mode ATAPI READ_10 - Compare the two data areas and check whether the areas are equal	
Execution Time	Approximately 20 seconds	
User Input	None	
Error	Number	Description
	90700	The command executed successfully
	90701	This nucleus cannot be executed because the Self-Test failed
	90702	The BE cannot enter normal operating mode
	90703	Unable to send the tray in
	90704	Unable to read TOC from disc
	90705	Invalid disc is loaded, please insert a DVD+RW disc
	90706	Unable to write, the DVD+R disc is full
	90707	No writable DVD+R sector found
	90708	Writing the test pattern to DVD failed
	90709	Reading back the test pattern from DVD failed
	90710	Compare check failed
Example	DS:> 907 090700: Testing on sector 0x36210: OK Test OK @	

Nucleus Name	**DS_BE_StatisticalInformationGet**
Nucleus Number	908
Description	Retrieve the statistical information from the basic engine
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the S2B GET_STATISTICAL_INFO command - In case of an AV3 Send the transparent BIT engine GET_STATISTICAL_INFO command - Display the info returned from the BE
Execution Time	Less than 1 second on AV2 2 seconds on AV3
User Input	None

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Error	Number	Description
	90800	The command executed successfully
	90801	There was a time-out while communicating
	90802	The Basic Engine returned an unexpected result
	90803	The BE returned an error code
	90804	No acknowledge received from BE
	90805	Communicating with the Basic Engine failed
	90806	The BE returned no info
Example (AV2)	DS:> 908 Number of times Tray went Open/Closed : 4 Total minutes the CD laser was on : 0 Total minutes the DVD laser was on : 0 Total minutes the write laser was on : 0 090800: Test OK @	
Example (AV3)	DS:> 908 Number of times Tray went Open/Closed 4 Total time the power power on (HR:MIN) 0:0h Total time of reading CDROM discs (HR:MIN) 0:0h Total time of reading high speed CD-R discs (HR:MIN) 0:0h Total time of reading other CD-R discs (HR:MIN) 0:0h Total time of reading high speed CD-RW discs (HR:MIN) 0:0h Total time of reading other CD-RW discs (HR:MIN) 0:0h Total time of reading high speed DVD SL discs (HR:MIN) 0:0h Total time of reading other DVD SL discs (HR:MIN) 0:0h Total time of reading high speed DVD DL discs (HR:MIN) 0:0h Total time of reading other DVD DL discs (HR:MIN) 0:0h Total time of reading high speed DVD+R discs (HR:MIN) 0:0h Total time of reading other DVD+R discs (HR:MIN) 0:2h Total time of reading high speed DVD+RW discs (HR:MIN) 0:0h Total time of reading other DVD+RW discs (HR:MIN) 0:35h Total time of writing DVD+R discs at 2.4 x (HR:MIN) 0:0h Total time of writing DVD+R discs at 4 x (HR:MIN) 0:0h Total time of writing DVD+RW discs at 2.4 x (HR:MIN) 0:0h Total time of writing DVD+RW discs at 4 x (HR:MIN) 0:0h 090800: Test OK @	

Nucleus Name	**DS_BE_StatisticalInformationReSet**	
Nucleus Number	909	
Description	Reset the statistical information in the basic engine	
Technical	- Send the RESET_STATISTICAL_INFO command - Send the POWER_DOWN command - Toggle the reset pin of the I2S interface	
Execution Time	2 seconds	
User Input	None	
Error	Number	Description
	90900	The command executed successfully
	90901	There was a time-out while communicating
	90902	The Basic Engine returned an unexpected result
	90903	The BE returned an error code
	90904	No acknowledge received from BE
	90905	Communicating with the Basic Engine failed
Example	DS:> 909 090900: Test OK @	

Nucleus Name	**DS_BE_ErrorLogGet**
Nucleus Number	910
Description	Get the error log from the basic engine
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the S2B GET_ERROR command - In case of an AV3 Send the transparent BIT engine GET_ERROR and GET_FATAL commands - Display the returned info
Execution Time	Less than 1 second
User Input	None

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Error	Number	Description
	91000	The command executed successfully
	91001	There was a time-out while communicating
	91002	The Basic Engine returned an unexpected result
	91003	The BE returned an error code
	91004	No acknowledge received from BE
	91005	Communicating with the Basic Engine failed
	91006	The BE returned no info
Example (AV2)	DS:> 910 Momentary errors (Byte 1 - Byte 7) : 0x00 0x00 0x00 0x00 0x00 0x00 0x00 Cumulative errors (Byte 1 - Byte 7) : 0x00 0x00 0x00 0x20 0x00 0x00 0x00 Fatal errors (Oldest - Youngest) : 0x00 0x00 0x00 0x00 0x00 091000: Test OK @	
Example (AV3)	DS:> 910 Momentary errors (0-9): 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 Cumulative errors (1-9) : 0x00 0x80 0x20 0x00 0x00 0x00 0x00 0x00 0x00 Software fatal assert : 799 engineproxy.cpp 091000: Test OK @	

Nucleus Name	**DS_BE_ErrorLogReset**	
Nucleus Number	911	
Description	Reset the error log in the basic engine	

Technical	- Check if an AV2 or AV3 is connected
	- In case of an AV2
	  - Send theS2B RESET_STATISTICAL_INFO command
	  - Send the S2B POWER_DOWN command
	  - Toggle the reset pin of the I2S interface
	- In case of an AV3 Send the transparent BIT engine RESET_STATISTICAL_INFO command	

Execution Time	2 seconds	
User Input	None	
Error	Number	Description
	91100	The command executed successfully
	91101	There was a time-out while communicating
	91102	The Basic Engine returned an unexpected result
	91103	The BE returned an error code
	91104	No acknowledge received from BE
	91105	Communicating with the Basic Engine failed
Example	DS:> 911 091100: Test OK @	

Nucleus Name	**DS_BE_JitterOptimise**
Nucleus Number	912
Description	Perform jitter optimisation: A formatted DVD must be loaded into the engine before executing this nucleus

Technical	- Check if an AV2 or AV3 is connected
	- Send the TRAY_IN command
	- Send the READ_TOC command
	- In case of an AV2
	  - Send the JITTER_COMMAND command with parameter 0x00 0x00
	  - Send the JITTER_COMMAND command with parameter 0x00 0x01
	  - Send the JITTER_COMMAND command with parameter 0x00 0x02 until offset 0x80 is received
	- In case of an AV3 Send the MEASURE_JITTER_BLER_PPN command and display the average jitter and bler values

Execution Time	Approximately 20 seconds
User Input	none

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Error	Number	Description
	91200	Optimising jitter succeeded
	91201	There was a time-out while communicating
	91202	The Basic Engine returned an unexpected result
	91203	The Basic Engine returned an error code
	91204	No acknowledge received from BE
	91205	Unable to send tray in
	91206	Unable to read the disc
	91207	No disc is loaded
	91208	Unknown disc is loaded
	91209	Unable to enter service mode
Example (AV2)	DS:> 912 091200: Jitter bathtub: (-42,135)(-40,127)(-38,106)(-36,106)(-34,101)(-32,97)(-30,92)(-28,92)(-26,92)(-24,92)(-22,86)(-20,80)(-18,86)(-16,86)(-14,80)(-12,80)(-10,80)(-8,80)(-6,80)(-4,86)(- 2,86)(0,86)(2,86)(4,92)(6,92)(8,101)(10,106)(12,111)(14,120)(16,123)(18,127)(20,142) Test OK @	
Example (AV3)	DS:> 912 091200: Average Jitter, Bler C1, Bler C2: (92,4,254) Test OK @	

Nucleus Name	**DS_BE_FocusOn**	
Nucleus Number	913	
Description	Put the laser of the BE into focus	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the FOCUS command with parameter 0x01 - In case of an AV3 Send the transparent BIT engine FOCUS command	
Execution Time	3 seconds	
User Input	None	
Error	Number	Description
	91300	Focus on succeeded
	91301	There was a time-out while communicating
	91302	The Basic Engine returned an unexpected result
	91303	The BE returned an error code
	91304	No acknowledge received from BE
	91305	Communicating with the Basic Engine failed
	91306	Unable to enter service mode
Example	DS:> 913 091300: Test OK @	

Nucleus Name	**DS_BE_FocusOff**	
Nucleus Number	914	
Description	Turn off putting the laser of the BE into focus	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the FOCUS command with parameter 0x00 - In case of an AV3 Send the transparent BIT engine FOCUS command	
Execution Time	Less than 1 second on AV2 2 seconds on AV3	
User Input	None	
Error	Number	Description
	91400	Focus off succeeded
	91401	There was a time-out while communicating
	91402	The Basic Engine returned an unexpected result
	91403	The BE returned an error code
	91404	No acknowledge received from BE
	91405	Communicating with the Basic Engine failed
	91406	Unable to enter service mode
Example	DS:> 914 091400: Test OK @	

Nucleus Name	**DS_BE_MotorOn**
Nucleus Number	915

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Description	Turn on the turntable motor	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the TURN_TABLE_MOTOR_ON command - In case of an AV3 Send the transparent BIT engine TTM command	
Execution Time	Less than 1 second on AV2 4 seconds on AV3	
User Input	None	
Error	Number	Description
	91500	Turn table motor is on
	91501	There was a time-out while communicating
	91502	The Basic Engine returned an unexpected result
	91503	The BE returned an error code
	91504	No acknowledge received from BE
	91505	Communicating with the Basic Engine failed
	91506	Unable to enter service mode
Example	DS:> 915 091500: Test OK @	

Nucleus Name	**DS_BE_MotorOff**	
Nucleus Number	916	
Description	Turn off the turntable motor	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 Send the TURN_TABLE_MOTOR_ON command - In case of an AV3 Send the transparent BIT engine TTM command	
Execution Time	Less than 1 second on AV2 4 seconds on AV3	
User Input	None	
Error	Number	Description
	91600	Turn table motor is off
	91601	There was a time-out while communicating
	91602	The Basic Engine returned an unexpected result
	91603	The BE returned an error code
	91604	No acknowledge received from BE
	91605	Communicating with the Basic Engine failed
	91606	Unable to enter service mode
Example	DS:> 916 091600: Test OK @	

Nucleus Name	**DS_BE_Tilt**	
Nucleus Number	920	
Description	Test the tilt mechanism control loop, or allow its proper functioning to be measured. Before executing this nucleus a disc must be loaded in the recorder	

Technical	- Check if an AV2 or AV3 is connected
	- In case of an AV2
	  - Send the TRAY_IN command
	  - Send the READ_TOC command
	  - Send the TILT_COMMAND command with parameter 0x00 0x00
	  - Send the TILT_COMMAND command with parameter 0x00 0x02
	- In case of an AV3 display a “not supported” message	

Execution Time	Approximately 15 seconds	
User Input	None	
Error	Number	Description
	92000	The command executed successfully
	92001	There was a time-out while communicating
	92002	The Basic Engine returned an unexpected result
	92003	The Basic Engine returned an error code
	92004	No acknowledge received from BE
	92005	Unable to send tray in
	92006	Unable to read the disc
	92007	No disc is loaded
	92008	Unknown disc is loaded
	92009	Unable to enter service mode
	92010	This nucleus is not supported by the engine

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Example(AV2)	DS:> 920 092000: Tilt sensor bathtub: (71,-12,145)(68,-12,135)(62,-10,120)(56,-92,97)(50,-75,86) (44,-59,80)(41,-52,80)(35,-37,86)(29,-22,86) (23,-7,92)(17,8,111)(11,23,135)(8,31,138)(5,39,158) Test OK @
Example (AV3)	DS:> 920 092010: Tilt function is not supported by the engine Error @

Nucleus Name	**DS_BE_CheckDisc**	
Nucleus Number	921	
Description	Check whether there is a disc inside the BE	
Technical	- Send the TRAY_IN command - Send the READ_TOC command - Display the Disc type info - If Disc type is a DVD+R(W), then read ADIP info. - Display manufacturer and media type.	
Execution Time	Approximately 10 seconds	
User Input	None	
Error	Number	Description
	92100	There was a disc inside the set
	92101	Unable to load the tray
	92102	Error received from BE
Example	DS:> 921 092100: Disc type: DVD+RW disc Disc manufacturer id: PHILIPS Media type id: 010 Test OK @ DS:> 921 090500: Disc type: None Test OK @ DS:> 921 092100: Disc type: DVD+R disc Disc manufacturer id: RICOHJPN Media type id: R00 Test OK @	

Nucleus Name	**DS_BE_SledgeMotor**	
Nucleus Number	922	
Description	Send the sledge to its home position, then to the middle of the disc, and then to the end.	
Technical	- Send the PCS_COMMAND command with parameter 0x03 0x00 - Send the PCS_COMMAND command with parameter 0x02 0x00 - Send the PCS_COMMAND command with parameter 0x00 0x01 - Send the PCS_JUMP_SLEGE_STEPS command for 3 times - Send the PCS_COMMAND command with parameter 0x00 0x00	
Execution Time	4 seconds on AV2 11 seconds on AV3	
User Input	None	
Error	Number	Description
	92200	The command executed successfully
	92201	There was a time-out while communicating
	92202	The Basic Engine returned an unexpected result
	92203	The BE returned an error code
	92204	No acknowledge received from BE
	92205	Communicating with the Basic Engine failed
	92206	Unable to enter service mode
Example	DS:> 922 092200: Test OK @	

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Nucleus Name	**DS_BE_ReadTocInfo**	
Nucleus Number	924	
Description	Read the TOC from the disc. This gives a good indication if the BE works properly.	
Technical	- Send the TRAY_IN command - Send the READ_TOC command - Display the TOC info.	
Execution Time	Approximately 10 seconds	
User Input	None	
Error	Number	Description
	92400	A disc is loaded, TOC info if echoed
	92401	Unable to load the tray
	92402	The BE has not returned TOC info
	92403	Error received from BE
Example	DS:> 924 092400: TOC info [hex] = 91 3A 0C Test OK @ DS:> 924 092403: The BE returned: 0x10 #{no_disc_error} No disc is detected Error @ DS:> 924 092403: The BE returned: 0x1e #{illegal_medium_error} Engine unable to handle current disc. Probably illegal medium. Error @	

Nucleus Name	**DS_BE_DiscErase**	
Nucleus Number	925	
Description	Perform a DC-erase on a DVD+RW disc.	
Technical	-Check if an AV2 or AV3 is connected -In case of an AV2 -Execute DS_BE_GetSelftestResults -Send the TRAY_IN command -Send the READ_TOC command -Send the SET_INPUT_TYPE command with parameter DC_ERASE -Overwrite the header of the DVD+RW disc with DC erase data -Send the SET_INPUT_TYPE command with parameter NORMAL. -In case of an AV3 display a “not supported” message	
Execution Time	Approximately 1:15 minute	
User Input	None	
Error	Number	Description
	92500	A DVD+RW disc is erased
	92501	This nucleus cannot be executed because the Self-Test failed
	92502	The BE cannot enter normal operating mode
	92503	Unable to send the tray in
	92504	Unable to read TOC from disc
	92505	Invalid disc is loaded, please insert a DVD+RW disc
	92506	Calibrating DVD+RW failed
	92507	Set Input Type command failed
	92508	Erasing the DVD+RW disc failed
	92509	Erasing is aborted by user
	92510	This nucleus is not supported by the engine
Example (AV2)	DS:> 925 The entirely disc will be erased. Are you sure you want this?[y/n] 092500: Test OK @	
Example (AV3)	092510: This nucleus is not supported by the engine Error @	

Nucleus Name	**DS_BE_RegionCodeSet**
Nucleus Number	928
Description	Set the region code in the AV3.

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Technical	- Check if an AV2 or AV3 is connected - In case of anAV2 display a “not supported” message - In case of an AV3 send the ATAPI SEND_KEY command	
Execution Time		
User Input	Region code	
Error	Number	Description
	92800	The command executed successfully
	92801	There was a time-out while communicating
	92802	The Basic Engine returned an unexpected result
	92803	The BE returned an error code
	92804	No acknowledge received from BE
	92805	Communicating with the Basic Engine failed
	92806	No disc is present, please insert disc
	92807	Region code out of range
	92808	User input wrong
	92809	Region counter expired
	92810	This nucleus is not supported by the engine
Example (AV2)	DS:> 928 092810: This nucleus is not supported by the engine Error @	
Example (AV3)	DS:> 928 1 092800: Test OK @	

Nucleus Name	**DS_BE_RegionCodeGet**	
Nucleus Number	929	
Description	Read the region code from the AV3.	
Technical	- Check if an AV2 or AV3 is connected - In case of anAV2 display a “not supported” message - In case of an AV3 send the ATAPI REPORT_KEY command	
Execution Time		
User Input	None	
Error	Number	Description
	92900	The command executed successfully
	92901	There was a time-out while communicating
	92902	The Basic Engine returned an unexpected result
	92903	The BE returned an error code
	92904	No acknowledge received from BE
	92905	Communicating with the Basic Engine failed
	92906	This nucleus is not supported by the engine
Example (AV2)	DS:> 929 092906: This nucleus is not supported by the engine Error @	
Example (AV3)	DS:> 929 092900: DVD region 1 Test OK @	

Nucleus Name	**DS_BE_RegionCounterReset**	
Nucleus Number	930	
Description	Reset the region counter in the AV3.	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 display a “not supported” message - In case of an AV3 send a special ATAPI RESET_REGION_COUNTER command	
Execution Time		
User Input	None	
Error	Number	Description
	93000	The command executed successfully
	93001	There was a time-out while communicating
	93002	The Basic Engine returned an unexpected result
	93003	The BE returned an error code
	93004	No acknowledge received from BE
	93005	Communicating with the Basic Engine failed
	93006	This nucleus is not supported by the engine

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Example (AV2)	DS:> 930 093006: This nucleus is not supported by the engine Error @
Example (AV3)	DS:> 930 093000: Test OK @

Nucleus Name	**DS_BE_AdjustLaserControl**	
Nucleus Number	931	
Description	Adjust the DVD-M (with the OPU) with PCBA. (So adjusts the two PCBS to each other)	
Technical	- Check if an AV2 or AV3 is connected - In case of an AV2 display a “not supported” message - In case of an AV3 adjust the DVD-M (with the OPU) with PCBA by sending a S2B command to align the PCBs to each other.	
Execution Time	30 seconds	
User Input	None	
Error	Number	Description
	93100	The command executed successfully
	93101	There was a time-out while communicating
	93102	The Basic Engine returned an unexpected result
	93103	The BE returned an error code
	93104	No acknowledge received from BE
	93105	Communicating with the Basic Engine failed
	93106	Unable to enter service mode
	93107	This nucleus is not supported by the engine
Example (AV2)	DS:> 931 093107: This nucleus is not supported by the engine Error @	
Example (AV3)	DS:> 931 093100: Test OK @	

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System (SYS)

Nucleus Name	**DS_SYS_HardwareVersionGet**	
Nucleus Number	1200	
Description	Get the hardware version and type of the digital board	
Technical	Initialise the PIO pins of the Codec Read the segment header in FLASH and determine hardware version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120000	Getting the hardware version and type of the digital board succeeded
	120001	Getting the hardware version and type of the digital board failed
	120002	Wrong hardware version read from FLASH
Example	DS:> 1200 120000: Hardware ID = 0x29 Test OK @	

Nucleus Name	**DS_SYS_SoftwareVersionBootGet**	
Nucleus Number	1201	
Description	Get the version of the boot software on the digital board	
Technical	Read the segment header in FLASH and determine Boot software version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120100	Getting the Boot software version succeeded
	120101	Getting the Boot software version failed
Example	DS:> 1201 120100: Software Boot Version = 0331 Test OK @	

Nucleus Name	**DS_SYS_SoftwareVersionDownloadGet**	
Nucleus Number	1202	
Description	Get the version of the download software on the digital board	
Technical	Read the segment header in FLASH and determine Download software version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120200	Getting the Download software version succeeded
	120201	Getting the Download software version failed
Example	DS:> 1202 120200: Software Download Version = 0001 Test OK @	

Nucleus Name	DS_SYS_SoftwareVersionApplGet	
Nucleus Number	1203	
Description	Get the version of the application software on the digital board	
Technical	Read the segment header in FLASH and determine Application software version	
Execution Time	Less than 1 second	
User Input	None	
Error	Number	Description
	120300	Getting the Application software version succeeded
	120301	Getting the Application software version failed
Example	DS:> 1203 120300: Software Application Version = 0001 Test OK @	

Nucleus Name	**DS_SYS_SoftwareVersionDiagnosticsGet**
Nucleus Number	1204
Description	Get the version of the diagnostics software on the digital board
Technical	Read the segment header in FLASH and determine Diagnostics software version
Execution Time	Less than 1 second
User Input	None

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Error	Number	Description
	120400	Getting the Diagnostics software version succeeded
	120401	Getting the Diagnostics software version failed
Example	DS:> 1204 120400: Software Diagnostics Version = 0001 Test OK @	

Nucleus Name	**DS_SYS_EepromUpload**	
Nucleus Number	1205	
Description	Upload the contents of the NVRAM on the analogue board or the digital board to the service PC, by using the X-modem protocol	
Technical	- Decode the user input - Determine whether to upload the analogue board or digital board NVRAM - Start uploading using the XMODEM protocol - Determine whether all was uploaded OK	
Execution Time	Depends on the chosen NVRAM and the User.	
User Input	Choose one of the following parameters for the nucleus: 1. Upload the contents of the NVRAM of the digital board 2. Upload the contents of the NVRAM of the analogue board Choose in the terminal on the control PC -> **transfer -> receive file**. Select **X-modem** protocol. Then click **receive** in the dialogue and fill in the file name in which you want to store the data.	
Error	Number	Description
	120500	Download succeeded.
	120501	User input is not valid.
	120502	Something went wrong while copying the data from NVRAM to SDRAM .
	120503	Something went wrong while transferring the data.
	120504	User cancelled the upload.
Example	DS:> 1205 1 120500: Test OK @	

Nucleus Name	**DS_SYS_EepromDownload**	
Nucleus Number	1206	
Description	Download a file with the contents of the NVRAM for the analogue board or the digital board from the service PC to the recorder, by using the X-modem protocol	
Technical	- Decode the user input and determine what EEPROM to fill: digital / analogue - Store the downloaded (using XMODEM) bytes in SDRAM first - Then copy these contents into the EEPROM after verification	
Execution Time	Depends on the chosen NVRAM and the User.	
User Input	Choose one of the following parameters for the nucleus: 1. Download the contents of the NVRAM of the digital board 2. Download the contents of the NVRAM of the analogue board Choose in the terminal of the control **PC -> transfer -> send file**. Select **X-modem** protocol. Then choose a file with the Browse button in the dialogue and click on **send**.	
Error	Number	Description
	120600	Download succeeded
	120601	The write to NVRAM failed.
	120602	Timeout. Too many retries.
	120603	A file was sent with a wrong header.
	120604	User cancelled the download.
	120605	User input is not valid.
	120606	Unknown Error
Example	DS:> 1206 1 120600: Test OK @	

Nucleus Name	**DS_SYS_DvIdNumberSet**
Nucleus Number	1207
Description	Set the IEEE 1394 unique ID
Technical	- Decode the user input - Store the id into NVRAM - Validate the segment of storage by updating the checksum
Execution Time	Less than 1 second.

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User Input	The unique ID to be set.	
Error	Number	Description
	120700	Setting the unique DV ID succeeded
	120701	User input is not valid.
	120702	Setting the unique DV ID failed.
	120703	Write succeeded, but checksum is corrupt.
Example	DS:> 1207 1234567890 120700: Test OK @	

Nucleus Name	**DS_SYS_DvIdNumberGet**	
Nucleus Number	1208	
Description	Get the IEEE1394 unique ID	
Technical	- Read out the ID from the configuration segment and return this info to the user	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	120800	Getting the unique DV ID succeeded
	120801	Getting the unique DV ID failed
	120802	Reading an unexpected section version in NVRAM
Example	DS:> 1208 120800: The DvIdNumber is: 1234567890 Test OK @	

Nucleus Name	**DS_SYS_IicWrite**	
Nucleus Number	1209	
Description	Perform an IIC write action on the digital board	
Technical	- Determine bus ID, slave address, number of bytes to be written and the byte array of data from the user input - Initialise IIC - Write the data to the slave specified through IIC	
Execution Time	Less than 1 second	
User Input	The user input the number of bytes to write followed by the bytes to write: <..> Where the bus id is either 0 (normally used) or 1	
Error	Number	Description
	120900	Writing the data over IIC succeeded
	120901	The IIC bus was not accessible
	120902	There was a timeout writing to the device
	120903	The IIC acknowledge was not received
	120904	The communication with the device failed
	120905	Got unknown IIC bus error:
	120906	Unable to initialise IIC bus
	120907	Decoding bus ID unsigned value failed
	120908	Decoding slaveAddr unsigned value failed
	120909	Decoding nrBytes unsigned value failed
	120910	Bus ID out of range
	120911	nrBytes out of range
	120912	Unable to decode parameters
Example	DS:> 1209 0 0xa0 1 0x6 120900: 1 Bytes written Test OK @	

Nucleus Name	**DS_SYS_IicRead**
Nucleus Number	1210
Description	Perform an IIC read action on the digital board
Technical	- Determine the bus ID, slave address and number of bytes to read from the user input - Initialise IIC - Read the data form the slave specified
Execution Time	Less than 1 second

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User Input	The user inputs the bus number, the address to read them from and the number of bytes to read: <BusID><Slave address to read from><Number of bytes to read>Where the bus id is either 0 (normally used) or 1	
Error	Number	Description
	121000	Reading the data over IIC succeeded
	121001	The IIC bus was not accessible
	121002	There was a timeout writing to the device
	121003	The IIC acknowledge was not received
	121004	The communication with the device failed
	121005	There was an unknown IIC bus error
	121006	IIC bus initialisation failed
	121007	Decoding bus ID unsigned value failed
	121008	Decoding slave address unsigned value failed
	121009	Decoding number of bytes unsigned value failed
	121010	Bus ID out of range
	121011	nrBytes out of range
Example	DS:> 1210 0 0xa0 0x20 Read : 0x0000: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0008: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0010: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0018: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 121000: 0 0xa0 0x20 Test OK @	

Nucleus Name	**DS_SYS_UartWrite**	
Nucleus Number	1211	
Description	Perform an UART write action on the digital board on a specified UART	
Technical	- Decode the user input for the proper port to use - Write out the bytes through the indicated port	
Execution Time	Less than 1 second.	
User Input	The user inputs the UART to write to, the number of bytes and the bytes to be written to the UART. 1=UART port 1 : not used 2=UART port 2 : Bit Engine 3=UART port 3 : Analogue board <UartNr><Number of bytes to write><d1><d2><..><dx>	
Error	Number	Description
	121100	Writing the bytes to the UART succeeded
	121101	The user provided wrong input
	121102	Writing to the UART failed
Example	DS:> 1211 2 2 0xd1 0x01 121100: Test OK @	

Nucleus Name	**DS_SYS_UartRead**	
Nucleus Number	1212	
Description	Perform an UART read action on the digital board on a specified UART	
Technical	- Decode the user input for the port to read from - Read from the port and return data read to the user	
Execution Time	Less than 1 second.	
User Input	The user inputs the UART to read from. 1=UART port 1 : not used 2=UART port 2 : Bit Engine 3=UART port 3 : Analogue board <UartNr >	
Error	Number	Description
	121200	Reading the data from the UART succeeded
	121201	The user provided wrong input

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	121202	Reading the data from the UART failed
Example	DS:> 1212 2 121200: The HEX value that was read is: 0x50 0xD1 0x00 Test OK @	

Nucleus Name	**DS_SYS_VideoLoopThroughStart**	
Nucleus Number	1213	
Description	The video signal, which is conform the user input, is routed from the input to the output. The input is set using the proper nucleus to route the signal on the board(s). All outputs are enabled.	
Technical	- Decode the videosignal: PAL / NTSC and Y/C, RGB, CVBS,YUV - Initialise the Video Input Processor and check for valid signal - Initialise the Video Front End and start capturing frames to memory - Initialise the SYNC module - Initialise the Video Post Processing and retrieve frames from memory - Initialise the mixer - Initialise the DENC module - Route the signal to all outputs	
Execution Time	Less than 1 second, but stays running.	
User Input	<vipInput> <VideoOutput> <VideoStandard> 1. vipInput (CVBS, YC, YUV, RGB, 1 to 9(see table below)). LECO Premier specific User input / Video input / Data path to VIP 1 / RGB / SCART aux RGB in 2 / YC / SCART aux Y/C in 3 / CVBS / SCART aux CVBS 4 / CVBS / Tuner 5 / YC / Front Y/C 6 / CVBS / Front CVBS 7 / CVBS / SCART TV CVBS 8 / YC / CE mode Y/C in 9 / CVBS / CE mode CVBS in 10 / XPORT / XPORT 2. VideoOutput (YUV, RGB). 3. VideoStandard (PAL, NTSC).	
Error	Number	Description
	121300	Video LoopthroughStart succeeded
	121301	User input is not valid.
	121302	Initialisation of the VIP failed.
	121303	Unable to stop the loop through before restarting.
	121304	Video Signal on the input is not a valid signal.
	121305	Initialisation of the VFE failed.
	121306	The digital board hardware information is corrupt
Example	DS:> 1213 CVBS RGB PAL 121300: Test OK @	

Nucleus Name	**DS_SYS_VideoLoopThroughStop**	
Nucleus Number	1214	
Description	Stop routing the video input to all the outputs.	
Technical	Stop the DENC and the Video Front End	
Execution Time	Less than 1 second.	
User Input	-	
Error	Number	Description
	121400	VideoLoopthroughStop succeeded
	121401	DENC module on Codec failed.
Example	DS:> 1214 121400: Test OK @	

Nucleus Name	**DS_SYS_VideoLoop**
Nucleus Number	1215

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Description	The Codec generates a video signal with a specific signature and sends it to the output of the digital board. The user selects which video input path must be routed on the digital board and a video standard. The Codec encodes the video signal, checks the signature, and returns a conclusion. **Note:** Before executing this nucleus the user must route the video signal on the analog board with the proper nucleus.	
Technical	- Evaluate user input. - Reset the global variables, video memory. - Fill the video memory with a vertical colourbar. - Initialise the Codec SYNC-module. - Initialise the Codec MIXER-module. - Initialise the Codec VPP-module. - Initialise the Codec DENC-module. - Display the original image. - Initialise the VIP. - Initialise the Codec VFE-module. - Try to detect a sync in the VIP input. - Catch the received image in memory. - Display the received image. - Compare the received image with original image. - Create a conclusion.	
Execution Time	3 seconds.	
User Input	Video input of the digital board: - CVBS - YC - YUV - RGB - TEST (The video output will be routed to the video input on the digital board.) - 1 to 9 - LECO Premier specific (see table below) User input / Video input / Data path to VIP 1 / RGB / SCART aux RGB in 2 / YC / SCART aux Y/C in 3 / CVBS / SCART aux CVBS 4 / CVBS / Tuner 5 / YC / Front Y/C 6 / CVBS / Front CVBS 7 / CVBS / SCART TV CVBS 8 / YC / CE mode Y/C in 9 / CVBS / CE mode CVBS in 10 / XPORT / XPORT Video standard:- PAL - NTSC When no input is given, the nucleus will take TEST for video input and PAL for video standard.	
Error	Number	Description
	121500	Videoloop test succeeded.
	121501	Wrong user input.
	121502	The Codec SYNC-module cannot be initialised.
	121503	The Codec MIXER-module cannot be initialised.
	121504	The Codec VideoPostProcessor-module cannot be initialised.
	121505	The Codec DENC-module cannot be initialised.
	121506	The VideoInputProcessor cannot be initialised.
	121507	The VideoInputProcessor cannot detect a sync-signal.
	121508	The Codec VideoFrontEnd-module cannot be initialised.
	121509	The Codec VideoFrontEnd-module cannot capture a video field.
	121510	When selected the RGB video input: Error in colour red signal and/or Error in colour green signal and/or Error in colour blue signal. When selected one of the other video inputs: Error in luminance signal (Y) and/or Error in chrominance signal (U) and/or Error in chrominance signal (V).

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	121511	The digital board hardware information is corrupt
Example	DS:> 1215 cvbs ntsc 121500: Test OK @ DS:> 1215 cvbs pal 121508: The VideoInputProcessor cannot detect a sync-signal. Error @ DS:> 1215 yuv ntsc 121511: Error in luminance signal(Y) Error in chrominance signal(U) Error in chrominance signal(V) Error @	

Nucleus Name	**DS_SYS_AudioLoop**	
Nucleus Number	1216	
Description	The user first needs to select how the audio path must be routed on the analogue board and/or digital board before calling this nucleus. The user also has to route the audio outputs back to the inputs by means of cables. In this nucleus the Codec generates an audio sine signal with a specific signature and sends it to the output of the digital board. The Codec encodes the audio signal to MPEG I layer II and after this the signature of the signal will be checked.	
Technical	- The user needs to route the signal to the audio inputs so the test can encode the audio to MPEG I layer II - An audio signal is generated, resulting in a sine of 6kHz on the left and 12kHz on the right channel. - Then the signal is decoded in memory. - When both signals are detected correctly in the MPEG, the test succeeded.	
Execution Time	Approximately 9 seconds	
User Input	None	
Error	Number	Description
	121600	Testing the components on the audio signal path succeeded
	121601	The audio encoder did not initialise.
	121602	No audio could be generated.
	121603	The audio encoder did not encode audio.
	121604	The audio could not be decoded.
	121605	Frequency on left channel out of range.
	121606	Frequency on right channel out of range.
	121607	The frequencies on both channels are out of range.
	121608	Frequency on left channel out of range. Right channel silent.
	121609	Right channel is silent.
	121610	Frequency on right channel out of range. Left channel silent.
	121611	Left channel is silent.
	121612	Both channels are silent.
Example	DS:> 1216 121600: Test OK @	

Nucleus Name	**DS_SYS_SlashVersionSet**	
Nucleus Number	1217	
Description	Set the slash version of the system	
Technical	- Decode the user input for the slash version to set - Issue the command to set the slash version to the analogue board	
Execution Time	Less than 1 second.	
User Input	The slash version	
Error	Number	Description
	121700	Setting the slash version succeeded
	121701	Invalid slash version, no slash version is set.
	121702	Setting the slash version on the Analogue Board fails.
	121703	Invalid input.

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	121704	The returned error code from the analogue board is unknown:
	121705	No DS error code known for analogue board error:
	121706	There was no response from the analogue board.
	121707	Retrieving the current version failed
	121708	Unknown recorder layout type
	121709	Validating the section where the version is stored failed
	121710	Getting the configuration section from NVRAM failed
	121711	Initialisation of IIC or reaching NVRAM failed
Example	DS:> 1217 82 121700: Test OK @	

Nucleus Name	**DS_SYS_SlashVersionGet**	
Nucleus Number	1218	
Description	Get the slash version of the system	
Technical	- Issue the command to get the slash version to the analogue board - Return the received information to the user	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	121800	Getting the slash version succeeded
	121801	Getting the slash version failed
	121802	The IIC write failed
	121803	The IIC read failed
	121804	There was no response from the analogue board.
	121805	No DS error code known for analogue board error:
	121806	Reading the slash version failed
	121807	Initialisation of IIC or reaching NVRAM failed
	121808	Reading an unexpected section version in NVRAM
Example	DS:> 1218 121800: The slash version is: 82 Test OK @	

Nucleus Name	**DS_SYS_Virginize**	
Nucleus Number	1219	
Description	(Re-) Virginize the recorder. User data in the NVRAM of the analogue board is cleared	
Technical	Issue the command to return to the factory defaults to the analogue board	
Execution Time	1 second.	
User Input	None	
Error	Number	Description
	121900	Virginization succeeded
	121901	Virginization on the Analogue Board failed.
	121902	The returned error code from the analogue board is unknown:
	121903	No DS error code known for analogue board error:
	121904	There was no response from the analogue board.
Example	DS:> 1219 121900: Test OK @	

Nucleus Name	**DS_SYS_VirginModeOn**	
Nucleus Number	1220	
Description	Turn on the virgin mode functionality (e.g. the auto channel search upon start-up)	
Technical	Issue the command to set the bit for the virgin mode to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122000	Turning on the virgin mode succeeded
	122001	Turning on VirginMode on the Analogue Board failed.
	122002	The returned error code from the analogue board is unknown:
	122003	No DS error code known for analogue board error:

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	122004	There was no response from the analogue board.
	122005	Section validation or write failed in NVRAM
	122006	Reading the CONFIG section from NVRAM failed
	122007	Initialisation of IIC or reaching NVRAM failed
Example	DS:> 1220 122000: Test OK @	

Nucleus Name	**DS_SYS_VirginModeOff**	
Nucleus Number	1221	
Description	Turn off the virgin mode functionality (e.g. the auto channel search upon start-up)	
Technical	Issue the command to reset the bit for the virgin mode to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122100	Turning off the virgin mode succeeded
	122101	Turning off VirginMode on the Analogue Board failed.
	122102	The returned error code from the analogue board is unknown:
	122103	No DS error code known for analogue board error:
	122104	There was no response from the analogue board.
	122105	Section validation or write failed in NVRAM
	122106	Reading the CONFIG section from NVRAM failed
	122107	Initialisation of IIC or reaching NVRAM failed
Example	DS:> 1221 122100: Test OK @	

Nucleus Name	**DS_SYS_VirginModeGet**	
Nucleus Number	1222	
Description	Get the virgin mode functionality status (e.g. the auto channel search upon start-up)	
Technical	Issue the command to reset the bit for the virgin mode to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122200	Getting the virgin mode succeeded
	122201	Reading the Virgin Mode flag from NVRAM failed
	122202	Initialisation of IIC or reaching the NVRAM failed
	122203	Reading an unexpected version of the section in NVRAM
Example	DS:> 1222 122200: The Virgin Mode functionality is: ON Test OK @	

Nucleus Name	**DS_SYS_DisplayFatalOn**	
Nucleus Number	1223	
Description	Turn on the display-fatal functionality which displays debug-information on the display when encountering a fatal error condition from which could not be recovered automatically	
Technical	Issue the command to use the display-fatal functionality to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122300	Turning on the display-fatal functionality succeeded
	122301	Turning on the display-fatal functionality failed
	122302	The returned error code from the analogue board is unknown:
	122303	No DS error code known for analogue board error:
	122304	There was no response from the analogue board.
	122305	Section validation or write failed in NVRAM
	122306	Reading the section from NVRAM failed
	122307	Initialisation of IIC or reaching NVRAM failed
Example	DS:> 1223 122300: Test OK @	

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Nucleus Name	**DS_SYS_DisplayFatalOff**	
Nucleus Number	1224	
Description	Turn off the display-fatal functionality which displays debug-information on the display when encountering a fatal error condition from which could not be recovered automatically	
Technical	Issue the command to stop using the display-fatal functionality to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122400	Turning off the display-fatal functionality succeeded
	122401	Turning off the display-fatal functionality failed
	122402	The returned errorcode from the analogue board is unknown:
	122403	No DS errCode known for analogue board error:
	122404	There was no response from the analogue board.
	122405	Section validation or write failed in NVRAM
	122406	Reading the section from NVRAM failed
	122407	Initialisation of IIC or reaching NVRAM failed
Example	DS:> 1224 122400: Test OK @	

Nucleus Name	**DS_SYS_DisplayFatalGet**	
Nucleus Number	1225	
Description	Get the display-fatal flag of the recorder	
Technical	Issue the command to get the status of the display-fatal functionality to the analogue board	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	122500	Getting the display-fatal flag succeeded
	122501	Getting the display-fatal flag failed
	122502	The returned errorcode from the analogue board is unknown:
	122503	No DS errCode known for analogue board error:
	122504	There was no response from the analogue board.
	122505	Reading the display fatal flag failed
	122506	Initialisation of IIC or reaching NVRAM failed
	122507	Unexpected version read from NVRAM section
	122508	Reading the fatal flag from NVRAM failed
Example	DS:> 1225 122500: The Display Fatal functionality is ON Test OK @	

Nucleus Name	**DS_SYS_SettingsSet**	
Nucleus Number	1226	
Description	Programs the digital board settings into the boot EEPROM on the digital board.	
Technical	Evaluate user input. Set-up IIC-bus. Write data to boot EEPROM. Update checksum.	
Execution Time	1 second	
User Input	A large hexadecimal value that represents the digital board settings obtained from the XDIVTOOL.exe program or from a reference set.	
Error	Number	Description
	122600	The settings were successfully programmed.
	122601	User input is invalid.
	122602	IIC access failed.
Example	DS:> 1226 6469616774737462010102000101010101000020080000 122600: Test OK @	

Nucleus Name	**DS_SYS_SettingsDisplay**
Nucleus Number	1228
Description	Show the settings that are programmed in the BROM on the digital board.
Technical	Set-up IIC-bus. Read Digital Board Settings from boot EEPROM. Display the settings.

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Execution Time	1 second	
User Input	None.	
Error	Number	Description
	122800	The settings were successfully displayed.
	122801	IIC access failed.
	122802	Invalid settings
Example	DS:> 1228 Settings ID: 444248491D9420014E46332B00000000290403030001010200010100400808000 Board name: NF3+ Hardware ID: 29 Codec IC: PNX7100_C2/C3 Video Input Processor IC: SAA7118 Progressive Scan Deinterlacer IC: S2301 Progressive Scan Denc IC: None I-Link physical layer circuit IC: PDI1394P25 I-Link link layer circuit IC: PDI1394P40 Audio clock: Clock scheme 1 Bit engine connector: not available IDE connector 1: available IDE connector 2: available PCI connector: not available RAM size 64MByte ROM size (NOR FLASH bank 1) 8MByte ROM size (NOR FLASH bank 2) 8MByte ROM size (NAND FLASH) Not available Bit Engine: AV 3.1 122800: Test OK @	

Nucleus Name	**DS_SYS_SettingsGet**	
Nucleus Number	1229	
Description	Get the digital board diversity settings string that is programmed in the BROM on the digital board.	
Technical	- Set-up IIC-bus. - Read Digital Board Settings from boot EEPROM. - Read System Settings from boot EEPROM.-Display the settings.	
Execution Time	1 second	
User Input	None.	
Error	Number	Description
	122900	The settings were successfully displayed.
	122901	IIC access failed.
	122902	The settings are invalid
Example	DS:> 1229 122900: 6D7920626F617264000203000101010201010000020080000 Test OK @	

Nucleus Name	**DS_SYS_AudioLoopThroughStart**	
Nucleus Number	1230	
Description	Description: The audio input is routed from the input to all outputs. The input is set routing the signal with the proper nucleus. All outputs are enabled.	
Technical	- Encode the audio to AC3 in memory - Decode the AC3 in memory to audio on the outputs	
Execution Time	1second buffer time and 30 seconds playing.	
User Input	None.	
Error	Number	Description
	123000	AudioLoopthroughStart succeeded
	123001	Resetting the audio decoder failed
	123002	Resetting the audio encoder failed
	123003	Encoding the audio failed
	123004	Decoding the audio failed
Example	DS:> 1230 123000: Test OK @	

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Nucleus Name	**DS_SYS_AudioLoopThroughStop**	
Nucleus Number	1231	
Description	Stop routing the audio input to all the outputs	
Technical	Send the Mute command to the audio decoder and reset the audio decoder	
Execution Time	Less than 1 second.	
User Input	-	
Error	Number	Description
	123100	AudioLoopthroughStop succeeded
	123101	Resetting the audio decoder failed
	123102	Resetting the audio encoder failed
Example	DS:> 1231 123100: Test OK @	

Nucleus Name	**DS_SYS_SettingsHwIdSet**	
Nucleus Number	1232	
Description	This nucleus sets the HW-Id in the HW-diversity string	
Technical	- Read out the HW-diversity string - Modify the HW-ID in that string as requested - Write the modified HW-diversity string to the EEPROM	
Execution Time	Less than 1 second.	
User Input	- The hardware ID to set No input - The user will be asked for the ID	
Error	Number	Description
	123200	Setting the hardware ID succeeded
	123201	Setting the hardware ID failed
	123202	The user aborted setting the hardware ID, no changes made
Example	DS:> 1232 Enter the new HW ID of the digital board (Currently equals 21) Enter a value between 0 and 99: > 22 The HW ID will be set to: 22. Is that correct? ([Y/N]):y 123200: Test OK @ DS:> 1232 Enter the new HW ID of the digital board (Currently equals 22) Enter a value between 0 and 99: > The HW ID will be set to: 0. Is that correct? ([Y/N]):N 123202: Setting the HW ID was aborted by the user. Error @ DS:> 1232 99 123200: Test OK @	

Nucleus Name	**DS_SYS_SettingsDoubleCheck**	
Nucleus Number	1233	
Description	Double check whether stored HW-string equals actual HW as far as we can automatically detect this. An automatic and a manual mode is supported.	
Technical	- Read out the HW diversity string - Check whether these settings correspond the actual hardware - In case of modification: Write back the new HW-diversity settings.	
Execution Time	4 seconds in auto mode when everything matches	
User Input	- ‘manual’ or ‘MANUAL’ to enter manual mode - default is automatic mode where the nucleus stops upon and reports the first encountered error	
Error	Number	Description
	123300	Double checking the HW-diversity settings succeeded
	123301	Double check failed, a difference in settings was encountered
	123302	Reading the HW-diversity settings failed

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	123303	Writing the modified HW-diversity settings failed
Example	DS:> 1233 123300: Test OK @ DS:> 1233 manual 123300: Test OK @ DS:> 1233 123301: Hardware ID mismatch: in HW-Diversity string:99, actual in FLASH:0 Error @ DS:> 1233 manual Hardware ID mismatch! in HW-Diversity string:99, actual in FLASH:0 Enter the correct HW ID of the digital board. > 0 The HW-diversity string has been modified by you. Settings: Board name: DIAG Hardware ID: 0 Codec IC: PNX7100_MF3 Video Input Processor IC: SAA7118 Progressive Scan Deinterlacer IC: None Progressive Scan Denc IC: ADV7196 I-Link physical layer circuit IC: PDI1394P25 I-Link link layer circuit IC: PDI1394P40 Audio clock: Clock scheme 1 Bit engine connector: available IDE connector 1: available IDE connector 2: not available PCI connector: not available RAM size 32MByte ROM size (NOR FLASH bank 1) 8MByte ROM size (NOR FLASH bank 2) Not available ROM size (NAND FLASH) Not available Is it OK to program this inthe new HW-diversity string? ([y]es/[n]o):y Diversity HW-string programmed successfully. 123300: Test OK @ DS:>	

Nucleus Name	**DS_SYS_SettingsDITableFilenameSet**	
Nucleus Number	1234	
Description	This nucleus sets the Download table filename in the HW-diversity string	
Technical	- Retrieve the new filename from the user - Ask the user whether the filename is correct before setting it - Update the diversity settings to use the newly entered filename	
Execution Time	Dependent on the user confirmation	
User Input	- The filename to be set - No input - No new filename will be set	
Error	Number	Description
	123400	Setting the new filename succeeded
	123401	Unsupported setting of the current HW-diversity settings

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	123402	Setting the filename was aborted by the user.
Example	DS:> 1234 Enter the new Download Table Filename (Currently equals DVDR2001.001) Enter a filename: > The Download Table Filename will be set to: DVDR2001.001. Is that correct? ([Y/N]): 123402: Setting the filename was aborted by the user. Error @ DS:> 1234 Enter the new Download Table Filename (Currently equals DVDR2001.001) Enter a filename: >DVDR2002.001 The Download Table Filename will be set to: DVDR2002.001. Is that correct? ([Y/N]):Y 123400: Test OK @	

Nucleus Name	**DS_SYS_IicWriteRead**	
Nucleus Number	1235	
Description	Perform an IIC write-read action on the digital board	
Technical	- Determine bus ID, slave address, number of bytes to be written and the byte array of data from the user input - Initialise IIC - Write the data to the IIC slave - Read the data from the IIC slave	
Execution Time	Less than 1 second	
User Input	The user inputs the Bus ID, Slave Address, number of bytes to read, number of bytes to write and the bytes to be written <NucNr><BusId><SlaveAddr><ReadLen><WriteLen><WrByte0...WrByteN> Max number of bytes to write: 255 Max number of bytes to read: 255	
Error	Number	Description
	123500	Writing data to and reading data from the IIC slave succeeded
	123501	The IIC bus was not accessible
	123502	There was a bus timeout reading the device
	123503	The IIC acknowledge was not received
	123504	Unable to initialise IIC bus
	123505	The communication with the device failed
	123506	Unknown IIC bus error received
	123507	Decoding bus ID unsigned value failed
	123508	Decoding slave address unsigned value failed
	123509	Decoding number of bytes unsigned value failed
	123510	Bus ID out of range
	123511	Number of bytes out of range
Example	DS:> 1235 0 0xa0 0xf 1 0 0x0000: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0008:0x00 0x00 0x00 0x00 0x00 0x00 0x00 121000: Test OK @	

Nucleus Name	**DS_SYS_UartSetup**
Nucleus Number	1236
Description	Set up a configuration for the selected UART
Technical	- Parse user input - Use MIS_UART_Setup to setup the selected UART with the requested parameters
Execution Time	Less than 1 second

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User Input	The user inputs 6 parameters: <UartNr><baudrate><flowcontrol><databits><parity><stopbits> UartNr: 1=UART port 1 : not used (Chrysalis only) 2=UART port 2 : Bit Engine or DTTM (Chrysalis only) 3=UART port 3 : Analogue board baudrate: 115200,62500,57600,38400,19200,9600,4800,2400,1200 flowcontrol: 0=disabled 1=enabled databits: 7 or 8 parity: “NO”, “ODD” or “EVEN” stopbits: 1 or 2	
Error	Number	Description
	123600	Setting up the selected UART succeeded
	123601	User provided Invalid setup parameters
	123602	Setting up the selected UART Failed
	123603	Selected UART is not available
Example (Chrysalis)	DS:> 1236 2 38400 0 8 NO 1 123600: Test OK @	
Example (Leco)	DS:> 1236 2 38400 0 8 NO 1 123603: The selected UART is not available Error @	

Electronic Program Guide Board (EPGB)

Nucleus Name	**DS_EPGB_VersionGet**	
Nucleus Number	1300	
Description	Returns the version of the EPG board.	
Technical	- Issue the command to get the version of the EPG board to the analogue board - Return the received information to the user	
Execution Time	3 seconds.	
User Input	None	
Error	Number	Description
	130000	Getting the version succeeded
	130001	Communication with the analog board failed.
	130002	Communication with the EPG board failed.
	130003	There was no response from the analogue board.
	130004	No DS error code known for analogue board error.
Example	DS:> 1300 130000: Version : 6.1.9 Test OK @	

ANALOGUE SLAVE PROCESSOR (ASP)

Nucleus Name	**DS_ASP_Communication**	
Nucleus Number	1600	
Description	This nucleus checks the communication between the IIC controller of the Codec and the ASP.	
Technical	- Initialise IIC-bus. - Read something from ASP. - Handle the errorcode.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160000	Communicating with the ASP succeeded
	160001	The IIC bus was not accessible
	160002	There was a timeout reading the device
	160003	The IIC acknowledge was not received
	160004	An IIC-bus error occurred
	160005	Got unknown IIC bus error

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	160006	The IIC bus initialisation failed
Example	DS:> 1600 160000: Test OK @	

Nucleus Name	**DS_ASP_Version**	
Nucleus Number	1601	
Description	This nucleus returns the version number of the software running on the ASP and if available that of the display driver.	
Technical	Read versions from ASP and display it.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160100	Retrieving the software versions succeeded
	160101	The IIC bus initialisation failed.
	160102	The IIC bus failed.
	160103	The CRC checksum of the message is wrong.
Example	DS:> 1601 160100: Software version : 0.9 Display driver version: 0.1 Hardware version : 0x02 Hardware layout : 0x03 Hardware revision : 0x00 Test OK @	

Nucleus Name	**DS_ASP_RealTimeClockSetValues**	
Nucleus Number	1602	
Description	This nucleus is used to set the real time clock to the correct values.	
Technical	- Decode the user input. - Write RTC value to ASP.	
Execution Time	Less than 1 second.	
User Input	User must give time and date like this: hh:mm:ss dd/mm/yy	
Error	Number	Description
	160200	Setting the real time clock succeeded
	160201	The ASP initialisation failed.
	160202	The IIC bus failed.
	160203	Wrong user input.
Example	DS:> 1602 03:20:01 22/06/03 160200: Test OK @	

Nucleus Name	**DS_ASP_RealTimeClockGetValues**	
Nucleus Number	1603	
Description	This nucleus is used to retrieve the actual real time from the ASP	
Technical	- Read RTC value from ASP. - Decode the RTC value.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160300	Retrieving the real time succeeded
	160301	The ASP initialisation failed.
	160302	The IIC bus failed.
	160303	The CRC checksum of the message is wrong.
	160304	The Real Time Clock has been found invalid and thus set to default values.
Example	DS:> 1603 Time: 03:20:17 Date: 22/06/03 (dd/mm/yy) 160300: Test OK @	

Nucleus Name	**DS_ASP_RealTimeClockSetCorrection**
Nucleus Number	1604
Description	This nucleus sets the correction value needed for the real time clock

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Technical	T.B.D. !!	
Execution Time	Less than 1 second.	
User Input	none	
Error	Number	Description
	160400	Setting the correction values succeeded
Example	DS:> 1604 160400: T.B.D. !! Test OK @	

Nucleus Name	**DS_ASP_RealTimeClockAdjustment**	
Nucleus Number	1605	
Description	This nucleus sets a test signal for clock crystal measurement. The signal with a frequency of 1 kHz and duty cycle of 50% appears on pin RCC.	
Technical	Send Clock Adjustment command to the ASP.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160500	The test succeeded
	160501	The ASP initialisation failed.
	160502	The IIC bus failed.
Example	DS:> 1605 160500: Test OK @	

Nucleus Name	**DS_ASP_NTCGet**	
Nucleus Number	1606	
Description	This nucleus reads the value of the NTC-resistor connected to the ASP, which tells the ambient temperature to the processor.	
Technical	- Read the ADC input pin of the ASP that is connected to the NTC-resistor. - Display this value.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160600	Getting the NTC-value succeeded
	160601	The IIC bus failed
Example	DS:> 1606 160600: Temperature(NTC) ADC input value = 0x94 Test OK @	

Nucleus Name	**DS_ASP_FanSpeedSet**	
Nucleus Number	1607	
Description	This nucleus sets the speed of the fan that controls the temperature within the set.	
Technical	- Decode user input. - Set pio-pins FAN_C1 and FAN_C2.	
Execution Time	Less than 1 second.	
User Input	Speed to be set: off, low, medium, high	
Error	Number	Description
	160700	Setting the new fan speed succeeded
	160701	The IIC bus failed
	160702	The user provided wrong input
Example	DS:> 1607 low 160700: Test OK @	

Nucleus Name	**DS_ASP_LightDisplay**	
Nucleus Number	1608	
Description	This nucleus lights the entire display.	
Technical	- Set all segments on in the display buffer. - Set the grids correct in the display buffer. - Send the display buffer to the ASP.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	160800	Lighting the entire display succeeded

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	160801	IIC-bus communication failed
Example	DS:> 1608 160800: Test OK @	

Nucleus Name	**DS_ASP_BlinkDisplay**	
Nucleus Number	1609	
Description	This nucleus lights the entire display, and lets it blink.	
Technical	- Set all segments on in the blink buffer. - Set the grids correct in the blink buffer. - Send the blink buffer to the ASP.	
Execution Time	Less than 1 second.	
User Input	None or on to start the blinking of the display. off To stop the blinking of the display.	
Error	Number	Description
	160900	The test succeeded
	160901	IIC-bus communication failed
	160902	The user provided wrong input
Example	DS:> 1609 160900: Test OK @ DS:> 1609 off 160900: Test OK @	

Nucleus Name	**DS_ASP_DimmingDisplay**	
Nucleus Number	1610	
Description	This nucleus lights the entire display, and dims it.	
Technical	Change in a loop the display brightness from maximum to minimum.	
Execution Time	Less than 1 second.	
User Input	ON or OFF	
Error	Number	Description
	161000	The test succeeded
	161001	IIC-bus communication failed
	161002	The user provided wrong input
Example	DS:> 1610 ON 161000: Test OK @	

Nucleus Name	**DS_ASP_ClearDisplay**	
Nucleus Number	1611	
Description	This nucleus clears the display and deactivates dimming/blinking functionality	
Technical	- Make the display buffer empty. - Make the blink buffer empty. - Send the display buffer to the ASP. - Send the blink buffer to the ASP.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	161100	The test succeeded
	161101	IIC-bus communication failed
Example	DS:> 1611 161100: Test OK @	

Nucleus Name	**DS_ASP_KeyBoard**
Nucleus Number	1612
Description	This nucleus checks all keys of the keyboard by having the user confirm the key-code displayed of all keys. If the user presses a or A the test is aborted. If the user presses o or O the test is indicated as OK. If the user holds down PLAY for more than a second the test is indicated as OK, if the user holds down RECORD the test is indicated as failed.

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Technical	- Initialise the display. - Display the key pressed by the user on the display. - Monitor the service port for an abort and get the next key pressed. - Update the display and repeat previous steps until user stops / confirms. - Display the number of keys that were pressed.	
Execution Time	Depends on the user.	
User Input	None	
Error	Number	Description
	161200	Checking all keys succeeded
	161201	IIC-bus communication failed
	161202	The user signals a failure of the keyboard
	161203	The user aborted the test
Example	DS:> 1612 161200: Test OK @	

Nucleus Name	**DS_ASP_RemoteControl**	
Nucleus Number	1613	
Description	This nucleus checks the interface to the remote control by having the user confirm the key-code displayed. At least one key must be tested. If the user presses a or A the test is aborted. If the user presses o or O the test is indicated as OK. If the user holds down PLAY for more than a second the test is indicated as OK, if the user holds down RECORD the test is indicated as failed.	
Technical	- Initialise the display. - Display the key pressed by the user on the display. - Monitor the service port for an abort and get the next key pressed. - Update the display and repeat previous steps until user stops / confirms. - Display the number of keys that were pressed.	
Execution Time	Depends on the user.	
User Input	None	
Error	Number	Description
	161300	The test succeeded
	161301	IIC-bus communication failed
	161302	The user signals a failure of the remote control
	161303	The user aborted the test
Example	DS:> 1613 161300: Test OK @	

Nucleus Name	**DS_ASP_LEDsOn**	
Nucleus Number	1614	
Description	This nucleus switches on the RECORD, TRAY, and EPG-LED, when available	
Technical	- Check if the analogue board is a MOBO board, if so: - Read the ASP pio port. - Set the RECORD-LED bit on in this port. - Write the ASP pio port. - Read the ASP pio port. - Set the TRAY-LED bit on in this port. - Write the ASP pio port. - Read the ASP pio port. - Set the EPG-LED bit on in this port. - Write the ASP pio port. - Else - Set the RECORD-LED bit on. - Write the external ASP pio port. - Set the TRAY-LED bit on. - Write the external ASP pio port. - Set the EPG-LED bit on. - Write the external ASP pio port.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	161400	Switching on the LEDs succeeded
	161401	IIC-bus communication failed
Example	DS:> 1614 161400: Test OK @	

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Nucleus Name	**DS_ASP_LEDsOff**	
Nucleus Number	1615	
Description	This nucleus switches off the RECORD, TRAY, and EPG-LED, when available	
Technical	- Check if the analogue board is a MOBO board, if so: - Read the ASP pio port. - Set the RECORD-LED bit off in this port. - Write the ASP pio port. - Read the ASP pio port. - Set the TRAY-LED bit off in this port. - Write the ASP pio port. - Read the ASP pio port. - Set the EPG-LED bit off in this port. - Write the ASP pio port. - Else - Set the RECORD-LED bit off. - Write the external ASP pio port. - Set the TRAY-LED bit off. - Write the external ASP pio port. - Set the EPG-LED bit off. - Write the external ASP pio port.	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	161500	Switching off the LEDs succeeded
	161501	IIC-bus communication failed
Example	DS:> 1615 161500: Test OK @	

Nucleus Name	**DS_ASP_Reset**	
Nucleus Number	1616	
Description	This nucleus resets the ASP.	
Technical	- Reset the ASP by toggling the reset wire by a GPIO pin of the codec. - Wait 500ms according to the HSI.-Read Status from ASP. - Put ASP in normal mode.-Configure general ASP PIO. - Make a ASP pio pin low to read the version. - Get GPP40 - GPP47 and GPP48 - GPP55. - Decode hardware version, revision, and layout. - Configure the ASP clock. - Configure display, part 1. - Configure display, part 2. - Configure blinking. - Configure external ASP PIO. - Configure ADC input. - Configure remote control input. - Enable power on the AV3.	
Execution Time	3 seconds.	
User Input	None	
Error	Number	Description
	161600	Reset command succeeded
	161601	IIC-bus communication failed
Example	DS:> 1616 161600: Test OK @	

ANALOGUE BOARD EEPROM (AROM)

Nucleus Name	**DS_AROM_Communication**	
Nucleus Number	1700	
Description	Check the communication between the IIC controller of the Codec and the EEPROM	
Technical	- Initialise IIC - Read from a location in AROM	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	170000	Something is properly read so the communication is OK
	170001	The IIC bus was not accessible
	170002	There was a timeout reading the device

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	170003	The IIC acknowledge was not received
	170004	The communication with the device failed
	170005	The IIC bus failed
	170006	The IIC bus initialisation failed
Example	DS:> 1700 170000: Test OK @	

VIDEO MATRIX (VMIX)

Nucleus Name	**DS_VMIX_Communication**	
Nucleus Number	1800	
Description	This nucleus checks the communication between the IIC controller of the Codec and the Video Matrix on the analogue board	
Technical	Try to read anything from the video matrix by means of IIC	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	180000	Communicating wit the Video Matrix succeeded
	180001	An IIC-bus error occurred
	180002	There was a timeout reading the device
	180003	The IIC bus was not accessible
	180004	The IIC acknowledge was not received
	180005	There was an IIC error upon the stop-condition
	180006	The IIC bus was chosen wrong
	180007	The IIC functionality is not running
	180008	An unknown error was returned
Example	DS:> 1800 180000: Test OK @	

Nucleus Name	**DS_VMIX_Routing**	
Nucleus Number	1801	
Description	This nucleus performs the routing of the video signals in the set. It sets the video path according to the user input.	
Technical	- Determine whether the set is NAFTA/APAC or EUROPE - Switch the videomatrix according to the input specified by the user	
Execution Time	Less than 1 second.	
User Input	The user inputs the path Id of choice, as specified in tables below for Europe/NAFTA-APAC	
Error	Number	Description
	180100	Routing the video path succeeded
	180101	The user provided wrong input
	180102	There was no response from the video matrix
	180103	Could not retrieve region from analogue slave processor
Example	DS:> 1801 00 180100: Test OK @	

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Table 5-3 Available VIDEO path-Ids for EUROPE routing

EURO Path ID	Description
	(DbOut=Digital Board Output, DbIn = Digital Board Input)
00	DbOut-CVBS/YC/RGB to RearOut-CVBS/YC and Scart_1-RGB.
01	- DbOut-CVBS to RearOut-CVBS. - FrontIn-CVBS to DbIn-CVBS.
02	- DbOut-YC to RearOut-YC. - FrontIn-YC to DbIn-YC.
03	- DbOut-CVBS to Scart_1-CVBS. - Scart_2-CVBS to DbIn-CVBS.
04	- DbOut-YC to Scart_1-YC. - Scart_2-YC to DbIn-YC.
05	- DbOut-RGB to Scart_1-RGB. - Scart_2-RGB to DbIn-RGB.
06	- DbOut-CVBS to RearOut-CVBS. - Tuner-CVBS to DbIn-CVBS.
07	DbOut-CVBS to DbIn-CVBS.
08	DbOut-PSCAN to RearOut-YUV.
09	DbOut-YUV to RearOut-YUV.
10	- DbOut-CVBS to Scart_2-CVBS. - Scart_1-CVBS to DbIn-CVBS.
11	- DbOut-YC to Scart_2-YC. - Scart_1-YC to DbIn-YC.
12	Scart_2-RGB to Scart_1-RGB.
13	Scart_2-CVBS to Scart_1-CVBS.
14	Scart_1-CVBS to Scart_2-CVBS.

Table 5-4 Available VIDEO path-Ids for NAFTA / APAC routing

NAFTA Path ID	Description
	(DbOut=Digital Board Output, DbIn = Digital Board Input)
00	DbOut-CVBS/YC/YUV to RearOut-CVBS/YC/YUV.
01	- DbOut-CVBS to RearOut-CVBS. - FrontIn-CVBS to DbIn-CVBS.
02	- DbOut-YC to RearOut-YC. - FrontIn-YC to DbIn-YC.
03	- DbOut-CVBS to RearOut-CVBS. - RearIn-CVBS to DbIn-CVBS.
04	- DbOut-YC to RearOut-YC. - RearIn-YC to DbIn-YC.
05	- DbOut-YUV to RearOut-YUV. - RearIn-YUV to DbIn-YUV.
06	- DbOut-CVBS to RearOut-CVBS. - Tuner-CVBS to DbIn-CVBS.
07	DbOut-CVBS to DbIn-CVBS.
08	DbOut-PSCAN to RearOut-YUV.

AUDIO MATRIX (SOUND PROCESSOR) (AMIX)

Nucleus Name	**DS_AMIX_Communication**	
Nucleus Number	1900	
Description	This nucleus checks the communication between the IIC controller of the Codec and the Audio Matrix (sound processor) on the analogue board	
Technical	Test whether anything can be read from the sound processor	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	190000	Communicating wit the Audio Matrix succeeded
	190001	An IIC-bus error occurred
	190002	There was a timeout reading the device
	190003	The IIC bus was not accessible
	190004	The IIC acknowledge was not received
	190005	There was an IIC error upon the stop-condition
	190006	The IIC bus was chosen wrong
	190007	The IIC functionality is not running

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	190008	An unknown error was returned
Example	DS:> 1900 190000: Test OK @	

Nucleus Name	**DS_AMIX_Routing**	
Nucleus Number	1901	
Description	This nucleus performs the routing of the audio signals in the set. It sets the audio path according to the user input.	
Technical	- Determine whether the set is of type NAFTA-APAC or EUROPE - Parse the user input to determine the routing - According to parameters set the sound processor and multiplexers	
Execution Time	Less than 1 second.	
User Input	The user inputs the path ID of his/her choice, as specified in tables below for Europe/ NAFTA	
Error	Number	Description
	190100	Routing the audio path succeeded
	190101	Routing the audio path failed
	190102	There was an error resetting the sound processor
	190103	The user provided wrong input
	190104	There was no response from the ASP
Example	DS:> 1901 00 190100: Test OK @	

Table 5-5 *Available AUDIO path-Ids for* ***EUROPE*** *routing*

EURO Path ID	Description
	(DbOut=Digital Board Output, DbIn = Digital Board Input)
00	DbOut to All Outs.
01	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - FrontIn to DbIn.
02	- DbOut to Scart_1-AOut. - Scart_2-AIn to DbIn.
03	- DbOut to Scart_2-AOut. - Scart_1-AIn to DbIn.
04	- DbOut to RearOut for CVBS/YC. - Tuner to DbIn.
05	DbOut to RearOut-5.1.
06	DbOut to DbIn
07	Scart_2-AIn to Scart_1-AOut.
08	Scart_1-AIn to Scart_2-AOut.

Table 5-6 *Available AUDIO path-Ids for* ***NAFTA/APAC*** *routing*

NAFTA Path ID	Description
	(DbOut=Digital Board Output, DbIn = Digital Board Input)
00	DbOut to All Outputs.
01	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - FrontIn to DbIn.
02	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - RearIn1 (EXT2) for CVBS/YC to DbIn.
03	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - RearIn2 (EXT1) for YUV to DbIn.
04	- DbOut to RearOut for CVBS/YC, and RearOut for YUV. - Tuner to DbIn.
05	DbOut to RearOut-5.1.
06	DbOut to DbIn.

Nucleus Name	**DS_AMIX_VersionGet**
Nucleus Number	1902
Description	This nucleus gets the version information from the sound processor.
Technical	Read the information from the sound processor using IIC
Execution Time	Less than 1 second
User Input	-

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Error	Number	Description
	190200	Getting the version info from the sound processor succeeded
	190201	Getting the version info from the sound processor failed
Example	DS:> 1902 Hardware Version:0x 2, Revision Code :0x 7 MSP Product Code:0x19, ROM Version Code:0x48 190200: Test OK @	

Nucleus Name	**DS_AMIX_Control**	
Nucleus Number	1903	
Description	Test the controllability of the sound processor by performing a controlled reset	
Technical	Test the control register, contains 0x80 after reset and 0x0 after first read of this control register. MSP is reset and the control register is tested for the 0x80 reset indication	
Execution Time	1 second	
User Input	-	
Error	Number	Description
	190300	Testing the controllability succeeded
	190301	Accessing the MSP failed
	190302	Accessing the MSP succeeded, but wrong data was returned
Example	DS:> 1903 190300: Test OK @	

Note	**European sets only !!**	
Nucleus Name	**DS_AMIX_Beep**	
Nucleus Number	1904	
Description	Test the beeper functionality of the sound processor	
Technical	-	
Execution Time	3 seconds	
User Input	-	
Error	Number	Description
	190400	Testing the beeper succeeded
	190401	Testing the beeper failed
	190402	There was an error routing the test path
	190402	The user provided the wrong input
Example	DS:> 1904 ON 190400: Test OK @	

Nucleus Name	**DS_AMIX_CommunicationAdcDac**	
Nucleus Number	1906	
Description	This nucleus checks the communication between the IIC controller of the Codec and the ADC/DAC chip (UDA 1380) on the analogue board	
Technical	Test whether anything can be read from the ADC/DAC	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	190600	Communicating with the ADC/DAC succeeded
	190601	The IIC bus was not accessible
	190602	There was a timeout reading the device
	190603	The IIC acknowledge was not received
	190604	An IIC-bus error occurred
	190605	Got unknown IIC bus error
	190606	The IIC bus initialisation failed
Example	DS:> 1906 190600: Test OK @	

Nucleus Name	**DS_AMIX_Mute**
Nucleus Number	1907
Description	Set or unset the master mute of the ADC/DAC chip (UDA 1380) on the analogue board

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Technical	Send the master mute command via IIC	
Execution Time	Less than 1 second.	
User Input	'ON' or 'OFF'	
Error	Number	Description
	190700	Muting the sound processor succeeded
	190701	Muting sound processor failed
Example	DS:> 1907 190700: Test OK @	

FRONTEND TUNER (FRE)

Nucleus Name	**DS_FRE_Communication**	
Nucleus Number	2000	
Description	This nucleus checks the communication between the IIC controller of the Codec and the Front End (Tuner) on the analogue board	
Technical	Determine whether anything can be read from the FRE through IIC	
Execution Time	Less than 1 second.	
User Input	None	
Error	Number	Description
	200000	Communicating with the front end succeeded
	200001	The IIC bus was not accessible
	200002	There was a timeout reading the device
	200003	The IIC acknowledge was not received
	200004	An IIC-bus error occurred
	200005	Got unknown IIC bus error
	200006	The IIC bus initialisation failed
Example	DS:> 2000 200000: Test OK @	

Nucleus Name	**DS_FRE_ChannelSelect**	
Nucleus Number	2001	
Description	This nucleus sets the tuner to receive a valid audio and video signal	
Technical	-Parse the user input to determine all parameters to set -Pass these parameters to the respective parts using IIC	
Execution Time	Less than 1 second	
User Input	<Frequency*16> <video standard id> <Tuner> Tuner frequency: to tune the tuner to e.g. 216 MHz, this parameter must be 3456. (Since 216*16 = 3456. This is to avoid the decimal points to the parameter list.) Name Colour system Transmission standard Sound modulation PAL_BG_S PAL BG FM-Stereo PAL_BG_M PAL BG FM-Mono / NICAM PAL_I_M PAL I FM-Mono / NICAM PAL_DK_S PAL DK FM-Stereo PAL_DK_M PAL DK FM-Mono / NICAM NTSC_M_S NTSC M FM-Stereo Video Standard ID: The table below shows which video standards are possible ID Europe NAFTA / APAC 0 PAL_BG_S NTSC 1 PAL_BG_M Invalid 2 PAL_I_M Invalid 3 PAL_DK_S Invalid 4 PAL_DK_M Invalid Tuner: Select the tuner type that you want to tune. This input is not mandatory. (If no input is detected, tuner will be defined run-time (if recognised).) Tuner Tuner ID 1 FE1316 (Europe Philips) 2 FE1319 (Europe Philips) 3 TMQZ2-403A (Europe ALPS) 4 JS6B2-L121 (Europe Xuguang) 5 TCPK0601 (APAC Samsung) 6 TCMN0682 (NAFTA Samsung)	
Error	Number	Description
	200100	Setting the tuner channel succeeded
	200101	Invalid user input

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Nucleus Name	**DS_FRE_ChannelSelect**	
	200102	Getting the version of the set failed
	200103	Configuration of the tuner failed
	200104	Configuration of the IF module failed
Example	DS:> 2001 3456 0 1200100: Test OK @	

Nucleus Name	**DS_FRE_AFCReferenceVoltage**	
Nucleus Number	2002	
Description	This nucleus stores the reference voltage for the tuner in the factory settings	
Technical	- Parse the user input - Initialise IIC and NVRAM-connection - Put the new values in NVRAM	
Execution Time	Less than 1 second.	
User Input	The reference voltage to store, in a range between 0 and 255. (dec.)	
Error	Number	Description
	200200	Storing the reference voltage for the tuner succeeded
	200201	The user provided wrong input
	200202	The section in NVRAM could not be validated after write
	200203	Writing the value to NVRAM failed
	200204	Initialisation of IIC failed or NVRAM unreachable
Example	DS:> 2002 0xaa 200200: Test OK @	

Note	**European sets only!!**	
Nucleus Name	**DS_FRE_CommunicationIfModule**	
Nucleus Number	2003	
Description	This nucleus checks the communication with the IF(Intermediate Frequency) module of the front end	
Technical	Determine whether the IF module can be read through IIC	
Execution Time	Less than 1 second	
User Input	-	
Error	Number	Description
	200300	Communicating with the front end succeeded
	200301	The IIC bus was not accessible
	200302	There was a timeout reading the device
	200303	The IIC acknowledge was not received
	200304	An IIC-bus error occurred
	200305	Got unknown IIC bus error
	200306	The IIC bus initialisation failed
	200307	Not a Europe set
Example	DS:> 2003 200300: Test OK @	

Nucleus Name	**DS_FRE_TunerTypeGet**	
Nucleus Number	2004	
Description	This nucleus retrieves the tuner type information and translates this to the region involved as well.	
Technical	- Check the region through the ASP - Read out the tuner type through IIC	
Execution Time	Less than 1 second	
User Input	-	
Error	Number	Description
	200400	Getting the tuner type information succeeded
	200401	Getting the type of the tuner OK, but unknown type returned
	200402	Getting the tuner type information failed
Example	DS:> 2004 200400: NAFTA Tuner: TCMN0682 Test OK @	

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SCRIPT

Nucleus Name	**DS_IH_ScriptHandler**
Nucleus Number	Script
Description	The test requires no user interaction. A number of nuclei will be run before a message is returned indicating if there is a failure in the DVD Recorder. When a nucleus failed, the script stops and displays the message **"FAIL"**. Otherwise it displays **"PASS"** at the end when all nuclei are executed. During the execution of a script, a progress indicator is displayed on the display of the DVD Recorder.
Technical	Execute the included nuclei one by one If a nucleus fails quit and display the failed nucleus on the local display and service port
Execution Time	16 seconds
Included tests:	1. DS_ANAB_COMMUNICATIONECHO_NUC 2. DS_DCB_COMMUNICATIONECHO_NUC 3. DS_BROM_COMMUNICATION_NUC 4. DS_SYS_SETTINGSDISPLAY_NUC 5. DS_CHR_DEVTYPEGET_NUC 6. DS_CHR_INT_PIC_NUC 7. DS_CHR_DMA_NUC 8. DS_BROM_WRITEREAD_NUC 9. DS_NVRAM_COMMUNICATION_NUC 10. DS_NVRAM_WRITEREAD_NUC 11. DS_SDRAM_WRITEREADFAST_NUC 12. DS_FLASH_WRITEREAD_NUC 13. DS_FLASH_CHECKSUMPROGRAM_NUC 14. DS_SYS_HARDWAREVERSIONGET_NUC 15. DS_VIP_DEVTYPEGET_NUC 16. DS_VIP_COMMUNICATION_NUC 17. DS_DVIO_LINKDEVTYPEGET_NUC 18. DS_DVIO_PHYDEVTYPEGET_NUC 19. DS_DVIO_LINKCOMMUNICATION_NUC 20. DS_DVIO_PHYCOMMUNICATION_NUC 21. DS_PSCAN_COMMUNICATIONDENC_NUC 22. DS_PSCAN_COMMUNICATIONDEINTERLACER_NUC 23. DS_BE_COMMUNICATIONECHO_NUC 24. DS_ANAB_COMMUNICATIONIICNVRAM_NUC 25. DS_ANAB_COMMUNICATIONIICTUNER_NUC 26. DS_ANAB_COMMUNICATIONIICSOUNDPROCESSOR_NUC 27. DS_ANAB_COMMUNICATIONIICAVSELECTOR_NUC 28. DS_ANAB_CHECKSUMPROGRAM_NUC
Note!	**Invocation by holding down the PLAY button when powering up the system**
Note!	The following example is for a generation 2.1 DVD+RW recorder. The variant you test may behave differently. For a detailed description of the script-behaviour of your variant under test refer to the [RW2_1_SWA_DS].
Example	DS:> script Executing User/Dealer script. Busy executing NUC1100 1-28 Hello Analogue Board Busy executing NUC1000 2-28 Busy executing NUC200 3-28 Busy executing NUC1228 4-28 Settings ID: 4C4541440D0000000003030001010102010100002008000 0 Board name: LEAD Hardware ID: 0 Codec IC: PNX7100_MF3 Video Input Processor IC: SAA7118 Progressive Scan Deinterlacer IC: None Progressive Scan Denc IC: ADV7196 I-Link physical layer circuit IC: PDI1394P25 I-Link link layer circuit IC: PDI1394P40 Audio clock: Clock scheme 1 Bit engine connector: available IDE connector 1: available IDE connector 2: not available PCI connector: not available RAM size 32MByte ROM size (NOR FLASH bank 1) 8MByte ROM size (NOR FLASH bank 2) Not available ROM size (NAND FLASH) Not available Bit Engine: AV 2.0

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Example	Busy executing NUC100 5-28 Device ID 7100 Codec ID PNX7100_MF3 F-BCU (0x0102) 1.0 INTC (0x011d) 1.0 PCI-XIO(0x0113) 1.0 SIF (0x013b) 1.0 EJTAG (0x0104) 0.0 S-BCU (0x0102) 1.0 BOOT (0x010a) 1.0 CONFIG (0x013f) 1.0 RESET (0x0123) 1.0 DEBUG (0x0116) 0.0 UART0 (0x0107) 0.1 UART1 (0x0107) 0.1 UART2 (0x0107) 0.1 UART3 (0x0107) 0.1 I2C0 (0x0105) 0.1 I2C1 (0x0105) 0.1 GPIO (0x013c) 1.0 SYNC (0x013a) 1.0 DISP0 (0xa015) 0.2 DISP1 (0xa00f) 0.0 OSD (0x0136) 0.1 SPU (0xa00e) 0.0 MIXER (0x0137) 1.0 DENC (0x0138) 0.1 CCIR (0x0139) 1.0 VDEC (0x0133) 0.1 PARSER (0xa00d) 0.0 DV (0xa00c) 0.0 BEI (0xa00a) 0.0 IDE (0xa009) 0.0 SGDX (0xa008) 0.0 BYTE (0xa00b) 0.0 OUTPUT (0xa003) 0.0 ACOMP (0xa000) 0.0 VFE (0xa001) 0.0 VCOMP (0xa002) 0.0 SCR (0x0000) 0.0 SIFF (0xa011) 0.0 WMD (0xa010) 0.0 AUDIO0 (0xa015) 0.2 AUDIO1 (0xa00f) 0.0 PSCAN (0xa018) 0.0 Busy executing NUC114 6-28 Busy executing NUC115 7-28 Busy executing NUC201 8-28 Busy executing NUC300 9-28 Busy executing NUC301 10-28 Busy executing NUC401 11-28 Busy executing NUC501 12-28 Busy executing NUC503 13-28 BootCode checksum is: 0xBABEB432, which is correct Diagnostics checksum is: 0xBABED22B, which is correct Download checksum is: 0xBABE025F, which is correct Application checksum is: 0xBABE2825, which is correct Busy executing NUC1200 14-28 Hardware ID = 00 Busy executing NUC600 15-28 Found SAA7118 Busy executing NUC601 16-28 Busy executing NUC700 17-28 Device type of the link layer IC: ffc00301 Busy executing NUC701 18-28 Device type of the phy layer IC: 0 Busy executing NUC702 19-28 Busy executing NUC703 20-28 Busy executing NUC801 21-28 Busy executing NUC808 22-28 The IIC acknowledge was not received, which is correct Busy executing NUC900 23-28 Busy executing NUC1101 24-28 Busy executing NUC1102 25-28 Busy executing NUC1104 26-28 Busy executing NUC1105 27-28 Busy executing NUC1111 28-28 BootCode checksum is: 0xBABE6240, which is correct Diagnostics checksum is: 0xBABEDC9A, which is correct Download checksum is: 0xBABEA6B7, which is correct Application checksum is: 0xBABE5968, which is correct PASS DS:>

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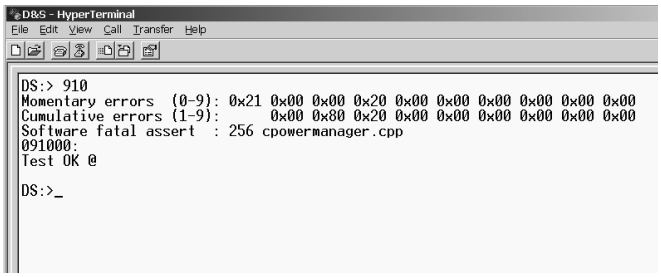
5.4 DVD Module Error code

With DSW command 910 the set software can retrieve an overview of all occurred engine errors.


D&S - HyperTerminal
File Edit View Call Transfer Help
DS:> 910
Momentary errors (0-9): 0x21 0x00 0x00 0x20 0x00 0x00 0x00 0x00 0x00 0x00
Cumulative errors (1-9): 0x00 0x80 0x20 0x00 0x00 0x00 0x00 0x00 0x00
Software fatal assert : 256 cpowermanager.cpp
091000:
Test OK @
DS:>_

5.4.1 Momentary Errors

Byte 0: latest error:

Overview of the BE error codes.

error code	error	meaning
0x00	no_error	No error has occurred
0x01	illegal_command_error	Command not allowed in this state or unknown command
0x02	illegal_parameter_error	Parameter(s) not valid for this command
0x03	command_timeout_error	The maximum execution time for the command has exceeded
0x04	sledge_home_error	The sledge could not be moved home
0x05	sledge_calibration_error	An error occurred during calibration of the sledge
0x06	sledge_unstable_error	The sledge detected unstable control
0x07	speed_timeout_error	Spindle motor could not reach its target speed within timeout
0x08	speed_window_error	Measured spinning speed is not within expected window
0x09	focus_timeout_error	Focus could not be achieved within the timeout
0x0A	focus_retries_error	The amount of focus retries expired
0x0B	focus_agc_error	The focus agc results are out of range
0x0C	radial_timeout_error	Servo didn't get on track within the timeout
0x0D	radial_retries_error	Servo didn't get on track after several retries
0x0E	radial_agc_error	The radial agc results are out of range
0x0F	radial_init_error	Unreliable signal scaling after the radial initialisation
0x10	hf_pll_error	HF-decoder pll could not lock to HF signal
0x11	wobble_pll_error	Wobble pll could not lock to wobble signal
0x12	subcode_timeout_error	Subcode information could not be read
0x13	subcode_notfound_error	Requested subcode item could not be found
0x14	header_timeout_error	Header information could not be read
0x15	adip_timeout_error	Adip information could not be read
0x16	adip_window_error	Adip address was not within expected window
0x17	adip_sync_error	No adip sync was detected
0x18	atip_timeout_error	Atip information could not be read
0x19	atip_notfound_error	Requested atip item could not be found
0x1A	atip_window_error	Atip address was not within expected window
0x1B	atip_sync_error	No atip sync was detected
0x1C	tray_error	Tray could not be closed or opened within the timeout
0x1D	seek_error	The requested seek couldn't be performed within the timeout
0x1E	no_hf_present_error	Attempt to read from a blank area
0x1F	record_error	An error occurred during the recording
0x20	illegal_stopaddress_error	The requested stopaddress with modify-stop-address is not valid
0x21	no_disc_error	No disc is detected
0x22	not_initialised_error	The system is not initialised (e.g. seek on unknown disctype)
0x23	illegal_medium_error	BE detected an unsupported medium during disc recognition
0x24	cd_frequency_error	Measured HF frequency is not within CD frequency range
0x25	dvd_frequency_error	Measured HF frequency is not within DVD frequency range
0x26	reserved(non_existing_bca_error)	Attempt to read non-existing bca information
0x27	reserved(bca_read_error)	An error occurred during reading of bca information
0x28	selftest_error	An error occurred during the self-test of the BE
0x29	i2c_error	The I2C interface does not operate
0x2A	laser_pll_error	Laser control pll did not lock or lost lock on write clock
0x2B	laser_forward_sense_error	Forward sense value didn't change with changing laser power
0x2C	jitter_optimisation_error	An error occurred during optimisation of the jitter
0x2D	tilt_calibration_error	An error occurred during calibration of the tilt frame
0x2E	reserved	
0x2F	frontend_offset_calib_error	The offset in the frontend couldn't be calibrated
0x30	reserved	
0x31	wsg_calculation_error	An error occurred in the calculation of the write strategy
0x32	buffer_overrun_error	The buffer input stream overran the buffer output stream
0x33	return_value_invalid_error	The requested information is not available for this inquiry
0x34	illegal_recording_speed_error	The selected speed is not allowed for a recording on this medium
0x35	opc_media_parameter_error	The media parameters (info in ATIP/ADIP) are invalid or not read
0x36	opc_record_power_error	The final optimum power was not reached
0x37	opc_start_power_low_error	OPC start power too low (optimum power is higher)
0x38	opc_start_power_high_error	OPC start power too high (optimum power is lower)

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error code	error	meaning
0x39	opc_power_calculation_error	Error during OPC power calculation (samples are wrong)
0x3A	opc_test_zone_full_error	OPC can't be performed because test zone is full
0x3B	opc_bad_jitter_measurement_error	The jitter measurement during OPC samples readback failed
0x3C	opc_read_samples_error	An error occurred during OPC readback sampling
0x3D	ropc_alpha_overflow_error	The determined value for the optimum power is too high
0x3E	ropc_alpha_ref_current_error	The alpha measurement reference current is wrong (IAN)
0x3F	ropc_alpha_gain_error	The alpha measurement alpha gain is wrong
0x40	beta_over_under_flow_error	During the walking OPC a beta over-/under-flow was detected
0x41	not_enough_calib_points_error	Not enough valid calibration points available for re-calibration
0x42	not_enough_power_error	The calculated power during re-calibration exceeds max power
0x43	illegal_reading_speed_error	The selected speed is not allowed for the requested command
0x44	servo_fatal_error	The actuator dissipation became too high during a servo recovery

This error is overwritten by the next player / inquiry command.

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Byte 1 - 9: cumulative errors of previous error occurences. Every individual error has its own bit in the 9-byte structure as described in the drawing below:

Format of the BE error bytes.

byte 1

b7	b6	b5	b4	b3	b2	b1	b0
reserved	FOCUS AGC ERROR	FOCUS RETRIES ERROR	FOCUS TIMEOUT ERROR	RADIAL AGC ERROR	RADIAL RETRIES ERROR	RADIAL TIMEOUT ERROR	RADIAL INIT ERROR

byte 2

TRAY ERROR	reserved	JITTER OPTIMIZATION ERROR	SLEDGE HOME ERROR	SLEDGE UNSTABLE ERROR	SLEDGE CALIBRATION ERROR	TILT SENSOR OFFSET CALIBRATION ERROR	TILT CALIBRATION ERROR

byte 3

RECORD ERROR	SEEK ERROR	NO DISC ERROR	NOT INITIALISED ERROR	ILLEGAL STOPADDRESS ERROR	ILLEGAL PARAMETER ERROR	ILLEGAL COMMAND ERROR	COMMAND TIMEOUT ERROR

byte 4

SERVO FATAL ERROR	reserved	reserved	HF PLL ERROR	NO HF PRESENT ERROR	HEADER TIMEOUT ERROR	SUBCODE NOTFOUND ERROR	SUBCODE TIMEOUT ERROR

byte5

WOBBLE PLL ERROR	ADIP SYNC ERROR	ADIP WINDOW ERROR	ADIP TIMEOUT ERROR	ATIP NOTFOUND ERROR	ATIP SYNC ERROR	ATIP WINDOW ERROR	ATIP TIMEOUT ERROR

byte6

WSG CALCULATION ERROR	DVD FREQUENCY ERROR	CD FREQUENCY ERROR	ILLEGAL RECORDING SPEED ERROR	SPEED WINDOW ERROR	SPEED TIMEOUT ERROR	NON EXISTING BCA ERROR	BCA READ ERROR

byte7

LASER FORWARD SENSE ERROR	NVRAM CHECKSUM UPDATE ERROR	FRONTEND OFFSET CALIBRATION ERROR	LASER PLL ERROR	ILLEGAL READING SPEED ERROR	ILLEGAL MEDIUM ERROR	SELFTEST ERROR	I^2C ERROR

byte8

OPC READ SAMPLES ERROR	OPC BAD JITTER MEASUREMENT ERROR	OPC TEST ZONE FULL ERROR	OPC POWER CALCULATION ERROR	OPC START POWER HIGH ERROR	OPC START POWER LOW ERROR	OPC RECORD POWER ERROR	OPC MEDIA PARAMETER ERROR

byte9

RETURN VALUE INVALID ERROR	BUFFER OVERRUN ERROR	BETA OVER/UNDER FLOW ERROR	NOT ENOUGH CALIB POINTS ERROR	NOT ENOUGH POWER ERROR	ROPC ALPHA GAIN ERROR	ROPC ALPHA REF CURRENT ERROR	ROPC ALPHA OVERFLOW ERROR

These errors are kept in memory until a power down of the drive (e.g. when recorder goes to standby) or reset of the drive.

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5.4.2 Cumulative errors

These errors are stored in EEPROM and are thus non-volatile showing the complete error history of the drive.
Byte 1 - 9: cumulative errors of previous player / inquiry error occurences. These bytes are the same as the nine bytes (1-9) of the Momentary errors

5.4.3 Software fatal assert

Gives row number and file name in the source code of the firmware of the data path of the AV3

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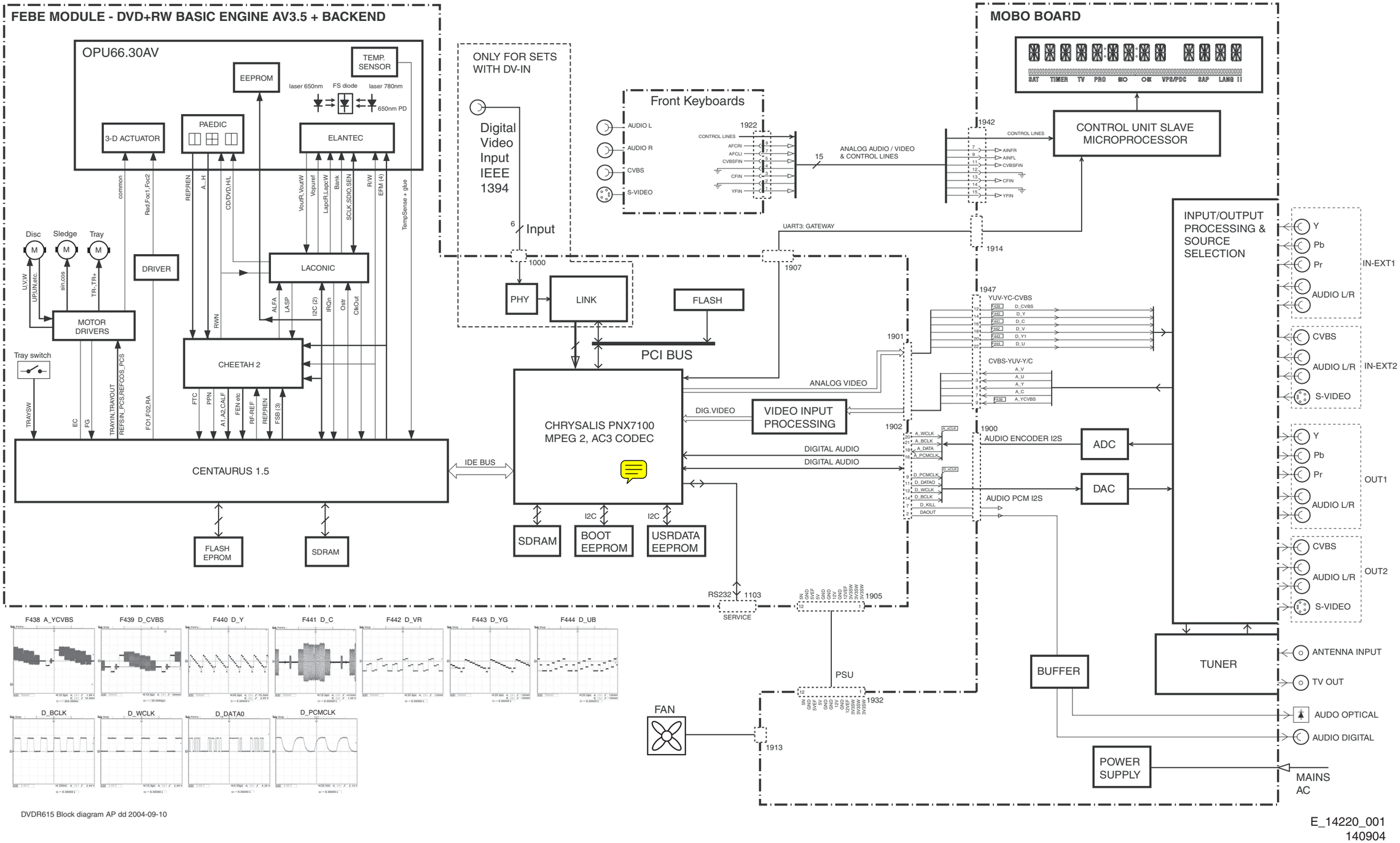
6. Block Diagrams, Waveforms, Wiring Diagram.

Overall Block Diagram of the Set



DVDR615 Block diagram AP dd 2004-09-10

E_14220_001
140904

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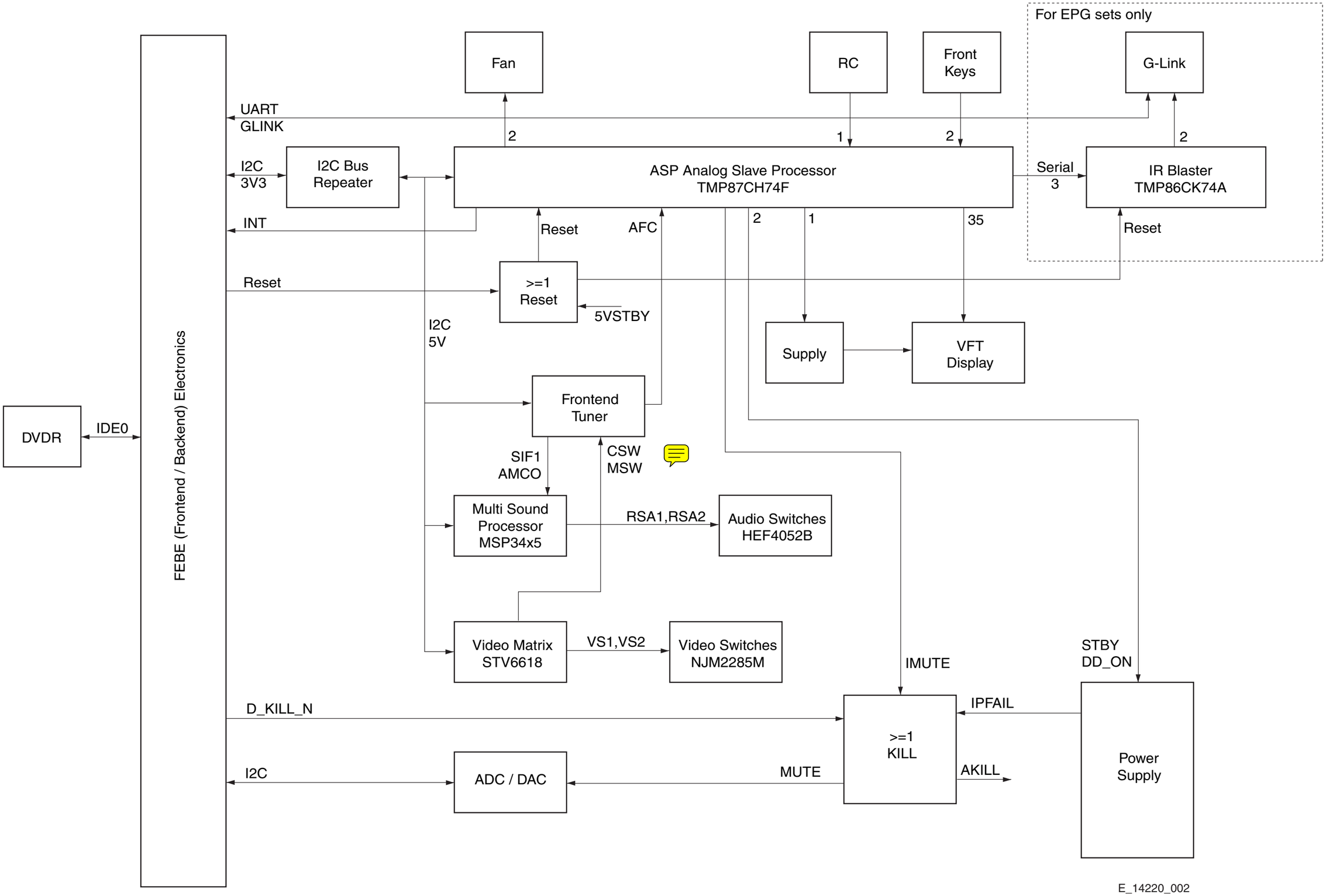
Control Block Diagram MOBO Board



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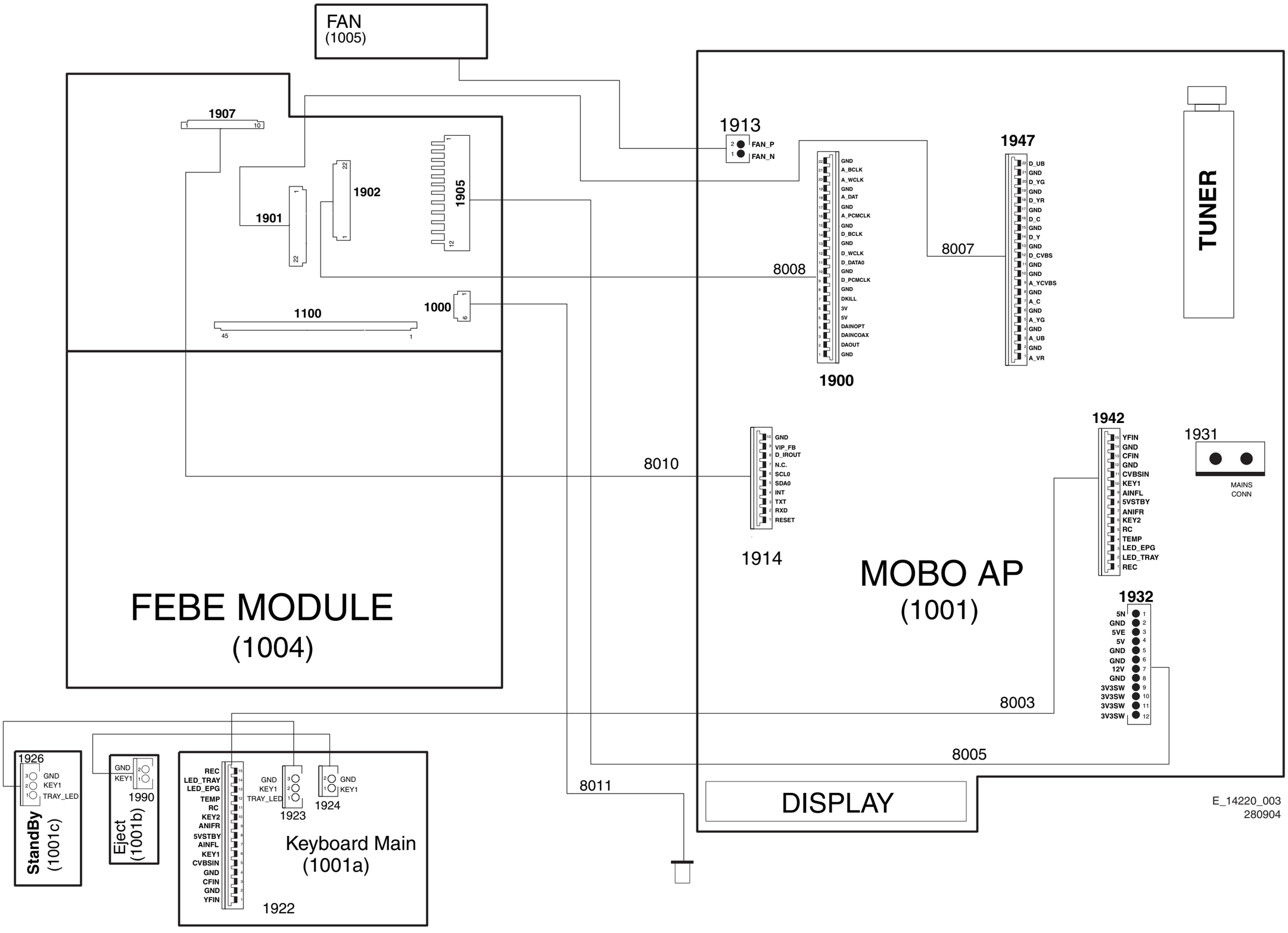
Wiring Diagram



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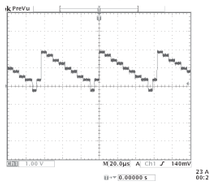
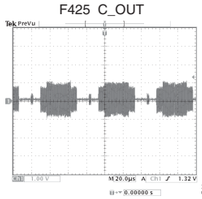
Waveforms

MOBO Board Waveforms

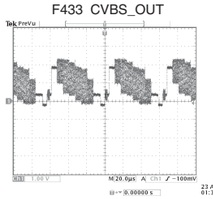
F422 Y_OUT



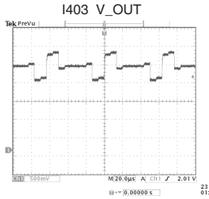
F425 C_OUT



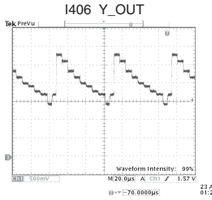
F433 CVBS_OUT



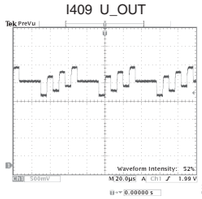
I403 V_OUT



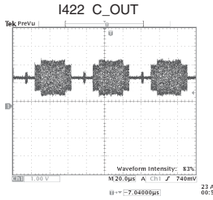
I406 Y_OUT



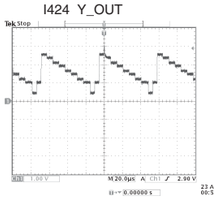
I409 U_OUT



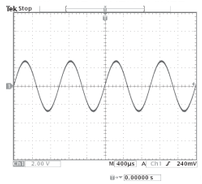
I422 C_OUT



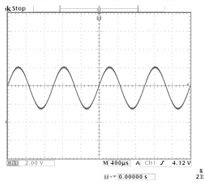
I424 Y_OUT



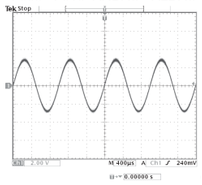
I505 / I512 AIN2R / AIN2L



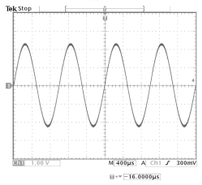
I515 / I518 AFER / AFEL



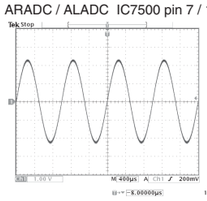
F005 / F016 ARDAC / ALDAC



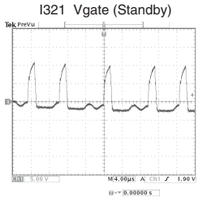
I502 / I510



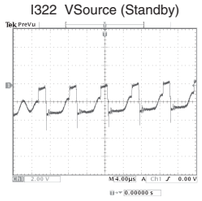
ARADC / ALADC IC7500 pin 7 / 1



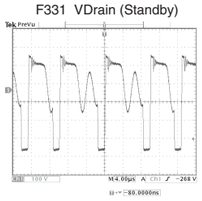
I321 Vgate (Standby)



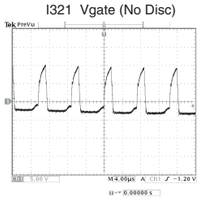
I322 VSource (Standby)



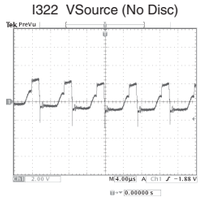
F331 VDrain (Standby)



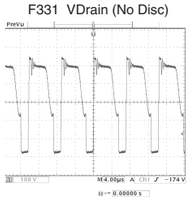
I321 Vgate (No Disc)



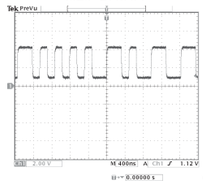
I322 VSource (No Disc)



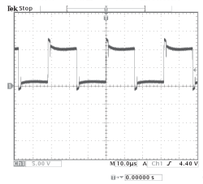
F331 VDrain (No Disc)



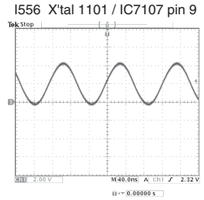
I525 DAOUT



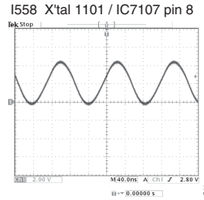
I555 7102 / 7104 Emitter



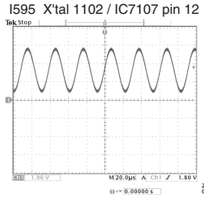
I556 X'tal 1101 / IC7107 pin 9



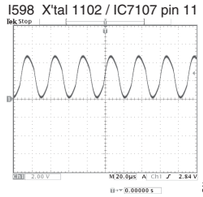
I558 X'tal 1101 / IC7107 pin 8



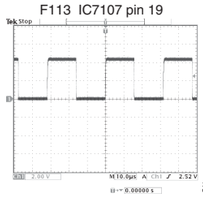
I595 X'tal 1102 / IC7107 pin 12



I598 X'tal 1102 / IC7107 pin 11

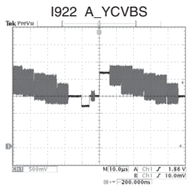


F113 IC7107 pin 19

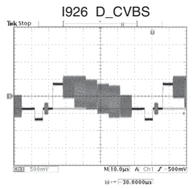


FEBE Board Waveforms

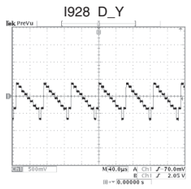
I922 A_YCVBS



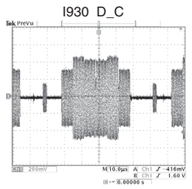
I926 D_CVBS



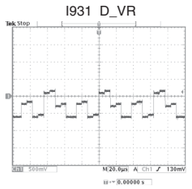
I928 D_Y



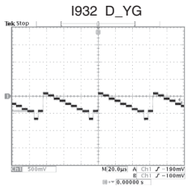
I930 D_C



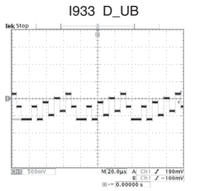
I931 D_VR



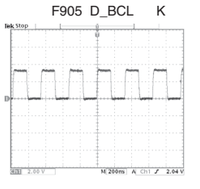
I932 D_YG



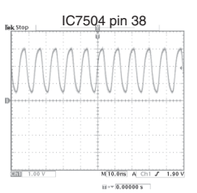
I933 D_UB



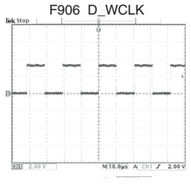
F905 D_BCL K



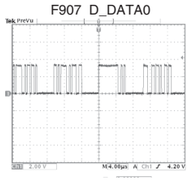
IC7504 pin 38



F906 D_WCLK



F907 D_DATA0



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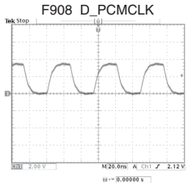
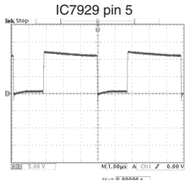
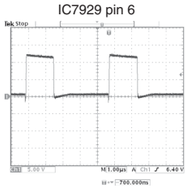


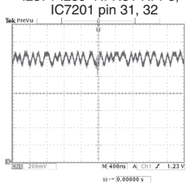
IC7929 pin 5



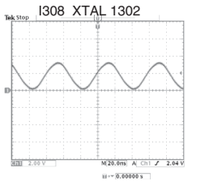
IC7929 pin 6



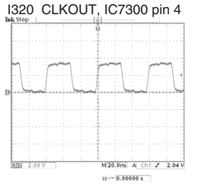
I257 / I259 RFN3 / RFP3, IC7201 pin 31, 32



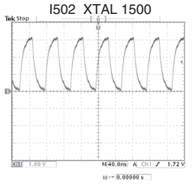
I308 XTAL 1302



I320 CLKOUT, IC7300 pin 4

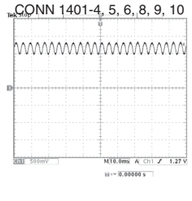


I502 XTAL 1500



CONN 1400-1, 2, 3, 4

CONN 1401-4, 5, 6, 8, 9, 10



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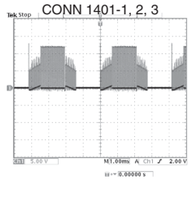
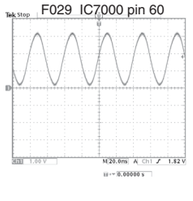
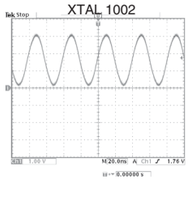


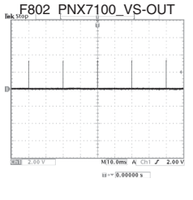
F029 IC7000 pin 60



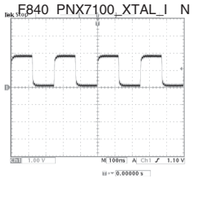
XTAL 1002



F802 PNX7100_VS-OUT



F840 PNX7100_XTAL_I N



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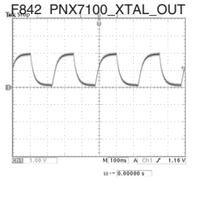

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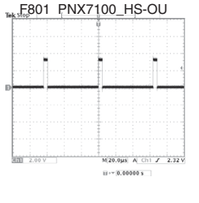

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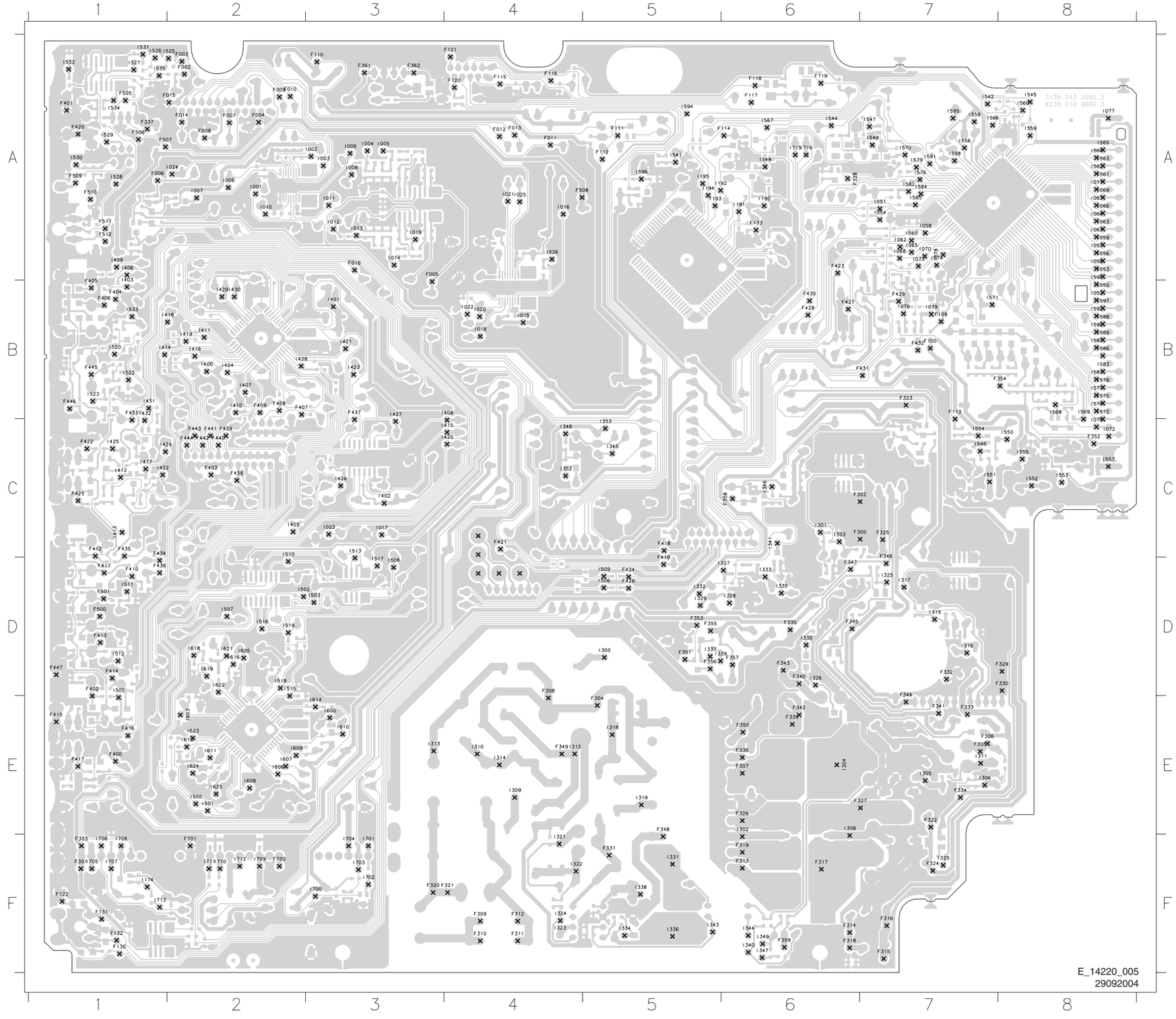
Test points overview MOBO Board



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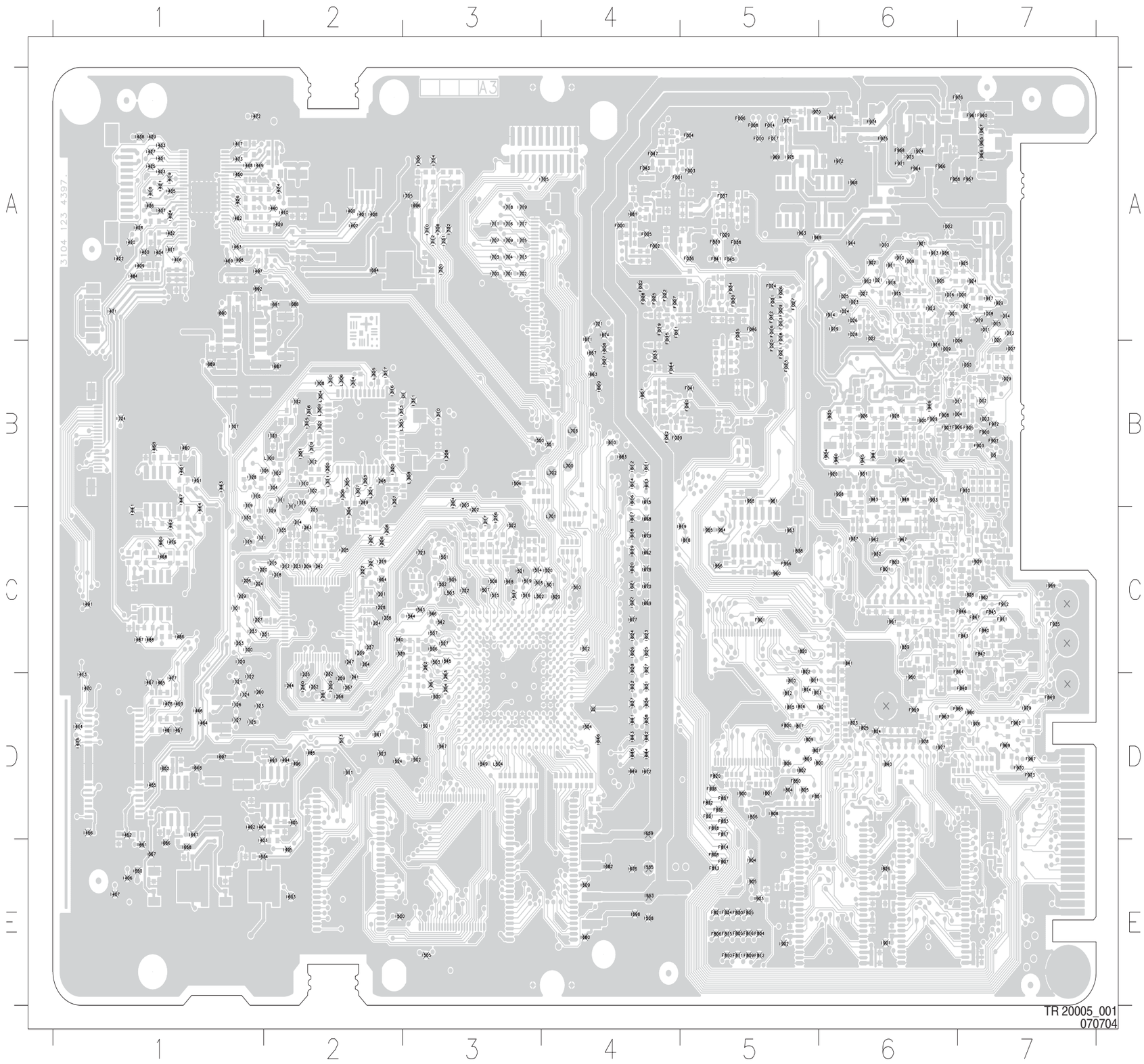

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U3 B7	F841 A5	I030 B7	I259 D2	I459 D1	I555 E4	I704 A3	I927 A7
F001 A4	F842 C7	I100 C1	I260 D1	I460 C1	I607 B4	I705 A4	I928 B6
F0010 A4	F843 C7	I101 C1	I261 D3	I461 B1	I608 B4	I706 A3	I929 A7
F002 A4	F844 C7	I102 B2	I262 C3	I463 A1	I609 B4	I707 A3	I930 B6
F003 A5	F845 C7	I103 B2	I263 D3	I464 D1	I610 B4	I708 A3	I931 B6
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F011 A4	F901 C5	I116 B2	I306 B2	I473 A1	I618 C4	I716 A3	I939 C7
F012 A5	F902 B7	I117 B2	I307 B2	I474 A2	I619 C4	I717 A3	I940 B6
F013 A5	F903 B7	I118 B1	I308 B3	I475 D1	I620 C4	I718 A3	I941 B6
F014 A5	F904 B6	I119 B1	I310 B3	I476 C1	I621 C4	I719 A3	I942 C6
F015 A4	F905 B7	I120 C1	I311 B3	I477 D1	I622 C4	I720 A3	I943 B6
F016 A5	F906 B6	I121 D1	I312 B2	I478 D1	I623 C4	I721 A4	I944 A6
F017 A5	F907 B6	I122 D1	I313 B2	I480 B1	I624 C4	I722 C3	I945 B6
F018 A5	F908 B6	I123 D1	I314 B2	I481 D1	I625 C4	I723 C3	I946 B6
F019 A4	F909 B6	I124 D1	I315 B2	I482 A1	I626 C4	I724 B1	I947 C6
F020 B5	F910 B7	I125 D1	I316 B2	I484 A1	I627 C4	I731 A3	I948 B6
F021 B5	F911 C7	I126 D1	I317 B2	I485 D2	I628 C4	I732 A3	I949 A5
F022 A4	F912 C7	I127 D1	I318 B2	I486 C1	I629 C4	I735 A3	I950 D6
F023 B5	F935 C7	I128 B1	I319 B2	I487 C1	I631 D4	I800 D5	I951 C6
F024 A5	F950 D7	I129 C2	I320 B2	I488 C1	I632 D4	I801 D5	I953 C5
F025 A4	F951 C7	I130 C1	I400 A2	I491 C1	I633 E2	I802 D5	I954 C5
F026 A5	F952 C7	I131 C1	I401 A2	I492 D1	I634 E1	I803 D5	I955 C5
F027 A5	F954 D6	I132 B2	I402 A2	I493 D2	I636 D4	I804 D5	I956 C5
F028 A4	F956 C5	I133 B2	I403 E1	I494 D2	I637 D4	I805 D5	I957 B4
F029 A5	F957 A7	I135 C2	I404 D1	I495 E2	I638 D4	I806 D5	I958 B5
F030 A5	F958 A6	I201 C2	I405 D2	I496 D2	I641 D4	I807 D5	I959 C7
F031 A5	F959 D6	I202 C3	I406 E1	I497 A1	I642 D4	I808 D5	I960 C5
F032 A4	F960 A7	I203 B3	I407 E1	I498 A1	I643 D4	I809 D5	I961 B5
F033 B4	F961 A7	I204 B3	I408 A2	I500 E2	I644 D4	I810 D5	I962 C7
F034 A5	F962 D7	I205 C2	I409 A1	I501 D3	I645 D4	I811 D5	I963 A5
F035 A5	F963 D6	I206 C2	I410 A2	I502 D3	I646 D4	I812 D5	I964 A6
F036 A5	F964 A6	I207 C2	I411 A1	I503 C3	I647 D1	I813 D5	I965 A7
F037 A5	F965 D7	I208 C2	I413 D1	I504 D4	I648 D1	I814 D5	I966 A7
F038 A5	F966 A6	I209 C2	I414 D1	I505 E3	I649 D4	I815 D5	I967 A7
F039 B4	F967 D7	I212 C2	I416 A1	I506 B3	I650 E1	I816 D5	I968 A6
F040 B5	F968 A6	I214 C2	I417 A1	I507 C3	I651 E1	I817 D5	I969 A5
F041 B5	F969 D7	I215 C2	I418 A1	I508 C3	I652 D1	I818 C5	I970 A5
F042 B4	F970 D7	I216 C3	I419 A1	I509 E4	I653 E4	I819 C5	I971 A5
F043 A4	F971 A6	I217 C3	I420 A1	I510 C4	I654 C2	I820 C5	I972 A6
F044 B4	F972 B7	I218 C2	I421 A1	I511 D2	I656 E1	I821 D6	I973 A6
F045 A5	F973 D7	I219 C2	I422 A1	I512 C4	I657 B4	I822 C5	I974 A6
F046 A5	F974 A6	I220 C1	I423 A1	I513 D2	I658 E1	I823 D6	I975 A5
F047 A4	F975 A6	I221 C2	I424 A1	I514 C3	I659 D4	I824 D6	I976 D7
F800 D5	F976 A7	I222 C2	I425 A1	I515 C3	I662 C4	I825 D6	I977 D6
F801 C6	I001 A6	I223 C2	I426 A1	I516 C3	I663 B4	I826 E6	I978 D6
F802 C6	I0010 A7	I224 C1	I427 A1	I517 C3	I667 E1	I828 C7	I979 D7
F804 E5	I002 A6	I225 C2	I428 A1	I518 C3	I668 C4	I836 D5	I980 D7
F805 E5	I003 B7	I226 C1	I429 A1	I519 C3	I669 C4	I838 C5	L100 B2
F806 E5	I004 B6	I227 C1	I430 A1	I520 C4	I670 C4	I839 C6	L301 B2
F807 E5	I005 A6	I228 C2	I431 A1	I521 C3	I671 A4	I840 D6	L303 B2
F808 E5	I006 B6	I229 C1	I432 A1	I522 C3	I672 D4	I841 C6	L304 B2
F809 E5	I007 B7	I231 C2	I433 A1	I523 D2	I674 A4	I900 D5	L305 B2
F810 E5	I008 A6	I232 D2	I434 A1	I524 D2	I676 E4	I901 E6	L306 B2
F811 E5	I009 B6	I233 C1	I435 A1	I527 C3	I677 C4	I902 E5	L307 B2
F812 E5	I010 A6	I234 C2	I436 A1	I530 D3	I678 C4	I903 E5	L308 B3
F813 E5	I011 A7	I235 D2	I437 A1	I531 C3	I679 C4	I904 E5	L309 B2
F814 E5	I012 B7	I237 C2	I438 A1	I532 C3	I680 E4	I905 E5	L310 B2
F815 E5	I013 A7	I238 C2	I439 A2	I535 C3	I681 A4	I910 A6	L311 B2
F816 E5	I014 A7	I239 C2	I440 A2	I536 C3	I682 E4	I911 A6	L501 C4
F817 D5	I015 A7	I240 D2	I441 C1	I537 C3	I683 B4	I912 A6	L502 C3
F818 D5	I016 A6	I241 D2	I442 C1	I538 E4	I687 B2	I913 A6	L503 C3
F820 D5	I017 B6	I242 C2	I443 B1	I539 C2	I688 A2	I914 A6	L504 D3
F821 E5	I018 A7	I243 C2	I444 C1	I540 C2	I689 B1	I915 A6	L700 B4
F830 E5	I019 A7	I244 D2	I446 D1	I541 D2	I690 A1	I916 B6	L701 C4
F831 D5	I020 A7	I247 C2	I447 B1	I542 C3	I691 A2	I917 A7	L702 B4
F832 D5	I021 A6	I248 B2	I448 A1	I543 C3	I692 A1	I918 A6	L703 B4
F833 D5	I022 A6	I249 B2	I449 A1	I544 C3	I694 A2	I919 A6	
F834 E5	I023 A6	I250 D2	I450 A1	I545 C3	I696 A3	I920 B6	
F835 E5	I024 A6	I251 D2	I451 B1	I546 C3	I697 D1	I921 A6	
F836 D5	I025 A6	I252 D2	I452 D1	I547 D3	I698 E4	I922 A6	
F837 D5	I026 A6	I253 C1	I455 D1	I548 C3	I700 A3	I923 A6	
F838 D5	I027 A6	I254 D3	I456 D1	I549 D3	I701 A3	I924 A7	

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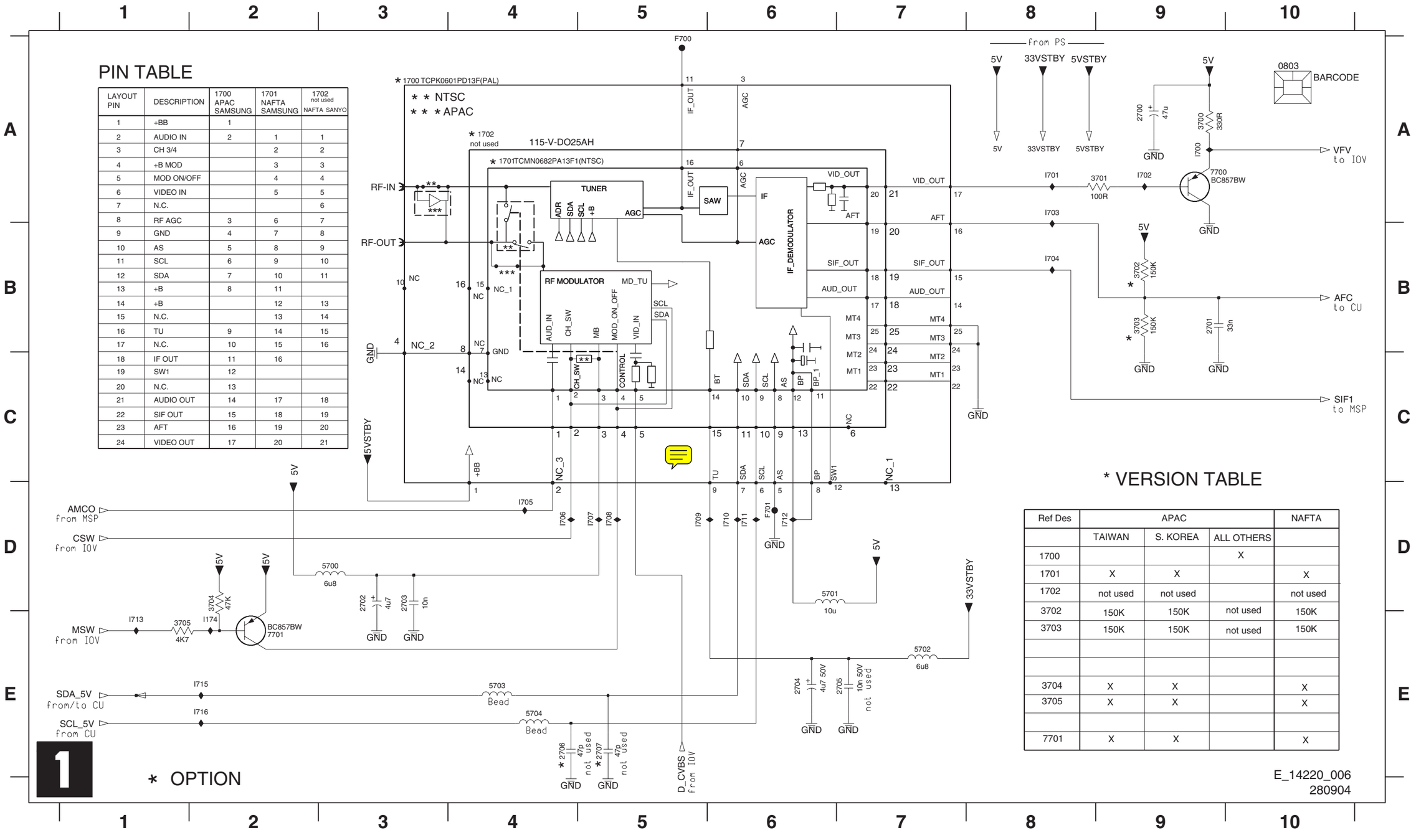
7. Circuit Diagrams and PWB Layouts

MOBO: Frontend Video (FV)

0803 A10 1700 A3 | 1701 A4 1702 A4 | 2700 A9 2701 B9 | 2702 D3 2703 D3 | 2704 E6 2705 E7 | 2706 E4 2707 E5 | 3700 A9 3701 A9 | 3702 B9 3703 B9 | 3704 D2 3705 E1 | 5700 D3 5701 D6 | 5702 E7 5703 E4 | 5704 E4 7700 A9 | 7701 E2 F700 A5 | F701 D6 I174 E2 | I700 A9 I701 A8 | I702 A9 I703 A8 | I704 B8 I705 D4 | I706 D4 I707 D5 | I708 D5 I709 D5 | I710 D6 I711 D6 | I712 D6 I713 E1 | I715 E2 I716 E2



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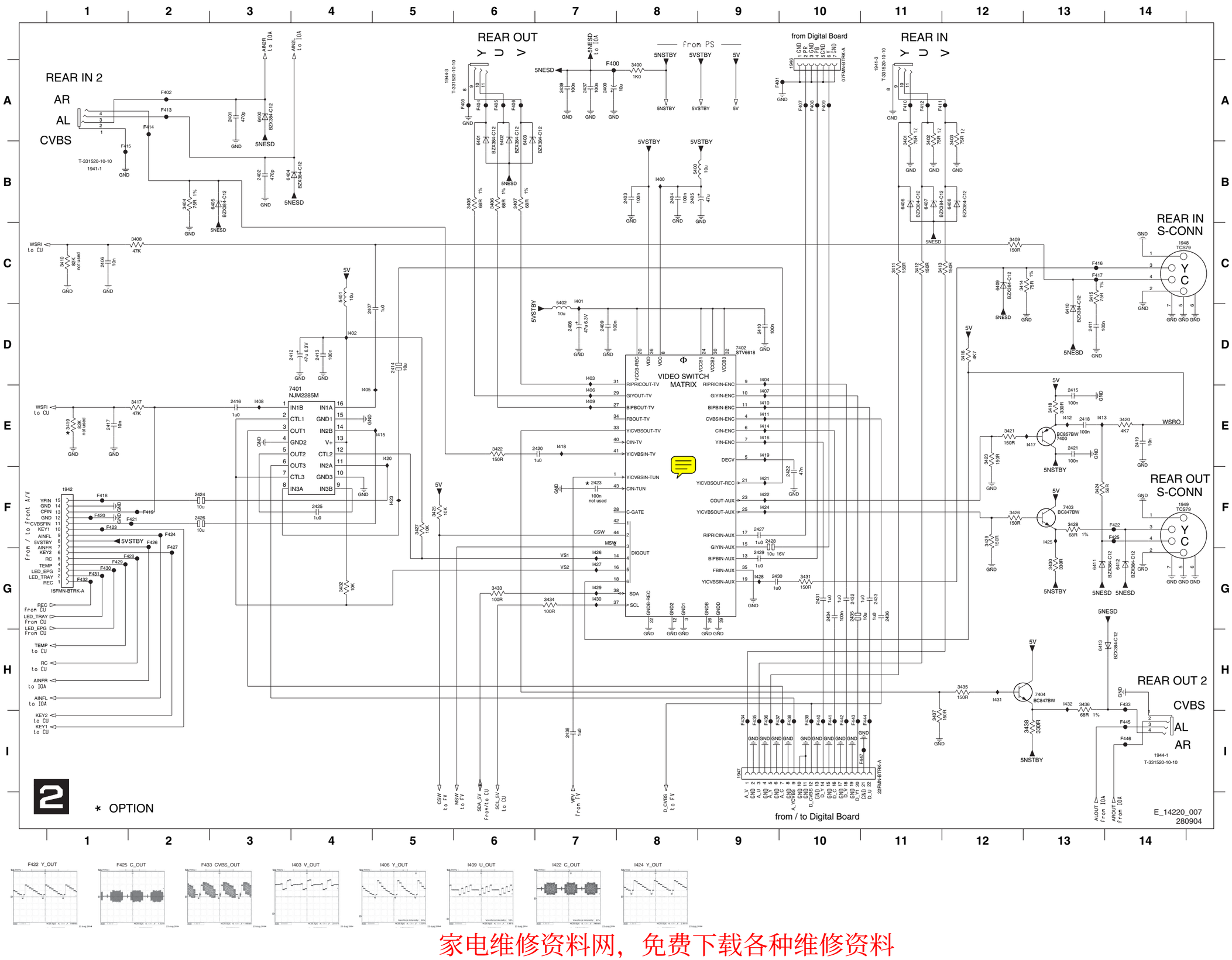
MOBO: Video In/Out (IOV)



1941-1 B1	F408 A10
1941-3 A11	F409 A10
1942 F1	F410 A11
1944-1 I14	F411 A11
1944-3 A5	F412 A11
1946 A10	F413 A2
1947 I9	F414 A2
1948 C14	F415 B1
1949 F14	F416 C13
2400 A7	F417 C13
2401 A3	F418 F1
2402 B3	F419 F2
2403 B8	F420 F1
2404 B8	F421 F2
2405 B8	F422 F14
2406 C1	F423 F1
2407 D4	F424 F2
2408 D7	F425 F14
2409 D7	F426 F2
2410 D9	F427 G2
2411 D13	F428 G2
2412 D4	F429 G1
2413 D4	F430 G1
2414 D5	F431 G1
2415 E13	F432 G1
2416 E3	F433 H14
2417 E1	F434 I9
2418 E13	F435 I9
2419 E14	F436 I9
2420 E7	F437 I10
2421 E13	F438 I10
2422 F10	F439 I10
2423 F7	F440 I10
2424 F2	F441 I10
2425 F4	F442 I10
2426 F2	F443 I10
2427 F9	F444 I11
2428 F9	F445 I14
2429 G9	F446 I14
2430 G9	F447 I11
2431 G10	I400 B8
2432 G10	I401 C7
2433 G11	I402 D4
2434 G10	I403 D7
2435 G10	I404 D9
2436 G11	I405 E4
2437 A7	I406 E7
2438 I7	I407 E9
2439 A7	I408 E3
3400 A8	I409 E7
3401 A11	I410 E9
3402 A11	I411 E9
3403 A12	I412 E13
3404 B2	I413 E13
3405 B6	I414 E9
3406 B6	I415 E5
3407 B6	I416 E9
3408 C2	I417 E13
3409 C12	I418 E7
3410 C1	I419 E9
3411 C11	I420 E5
3412 C11	I421 F9
3413 C11	I422 F9
3414 C12	I423 F5
3415 C13	I424 F9
3416 D12	I425 F13
3417 E2	I426 G7
3418 E13	I427 G7
3419 E1	I428 G9
3420 E14	I429 G7
3421 E12	I430 G7
3422 E6	I431 H12
3423 E12	I432 H13
3424 F13	
3425 F5	
3426 F12	
3427 F5	
3428 F13	
3429 F12	
3430 G13	
3431 G10	
3432 G4	
3433 G6	
3434 G7	
3435 H12	
3436 H13	
3437 I11	
3438 I13	
5400 B8	
5401 C4	
5402 D7	
6400 A3	
6401 A6	
6402 A6	
6403 A6	
6404 B3	
6405 B3	
6406 B11	
6407 B11	
6408 B12	
6409 C12	
6410 D13	
6411 G13	
6412 G14	
6413 H13	
7400 E13	
7401 E3	
7402 D9	
7403 F13	
7404 H13	
F400 A7	
F401 A9	
F402 A2	
F403 A6	
F404 A6	
F405 A6	
F406 A6	
F407 A10	

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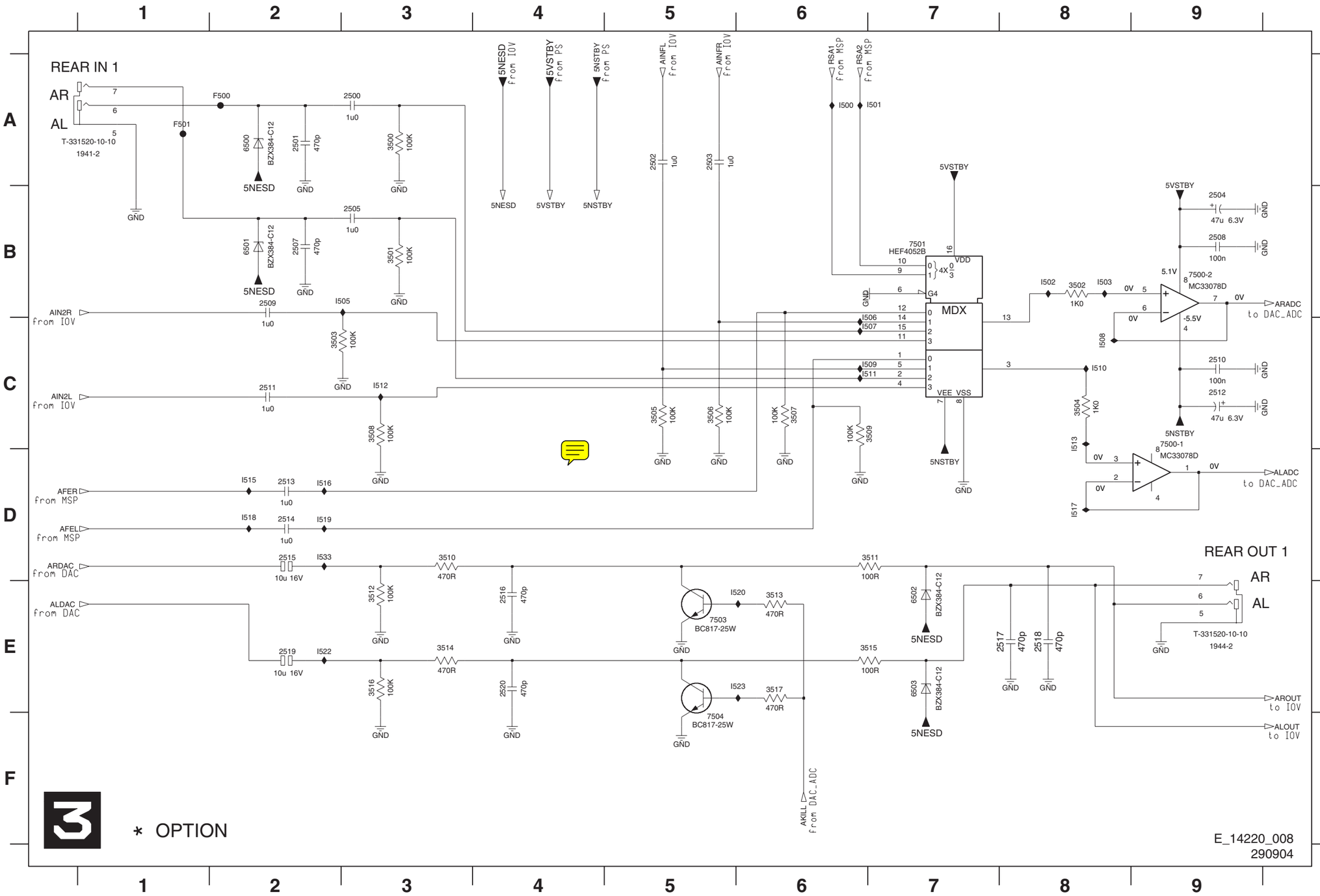
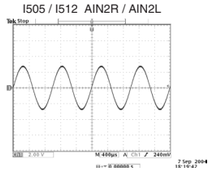
MOBO: Audio In/Out (IOA)

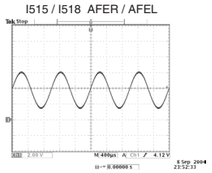


1941-2 A1
1944-2 E9
2500 A3
2501 A2
2502 A5
2503 A5
2504 B9
2505 B3
2507 B2
2508 B9
2509 B2
2510 C9
2511 C2
2512 C9
2513 D2
2514 D2
2515 D2
2516 E4
2517 E8
2518 E8
2519 E2
2520 E4
3500 A3
3501 B3
3502 B8
3503 C2
3504 C8
3505 C5
3506 C5
3507 C6
3508 C3
3509 C6
3510 D3
3511 D7
3512 E3
3513 E6
3514 E3
3515 E7
3516 E3
3517 E6
6500 A2
6501 B2
6502 E7
6503 E7
7500-1 C9
7500-2 B9
7501 B7
7503 E5
7504 F5
F500 A2
F501 A1
I500 A6
I501 A7
I502 B8
I503 B8
I505 B3
I506 B7
I507 C7
I508 C8
I509 C7
I510 C8
I511 C7
I512 C3
I513 C8
I515 D2
I516 D2
I517 D8
I518 D2
I519 D2
I520 E6
I522 E2
I523 E6
I533 D2

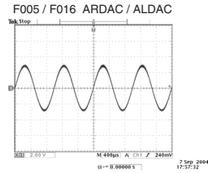
I505 / I512 AIN2R / AIN2L



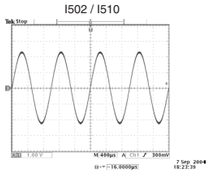
I515 / I518 AFER / AFEL



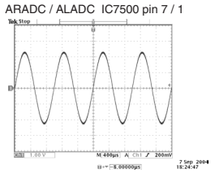
F005 / F016 ARDAC / ALDAC



I502 / I510



ARADC / ALADC IC7500 pin 7 / 1



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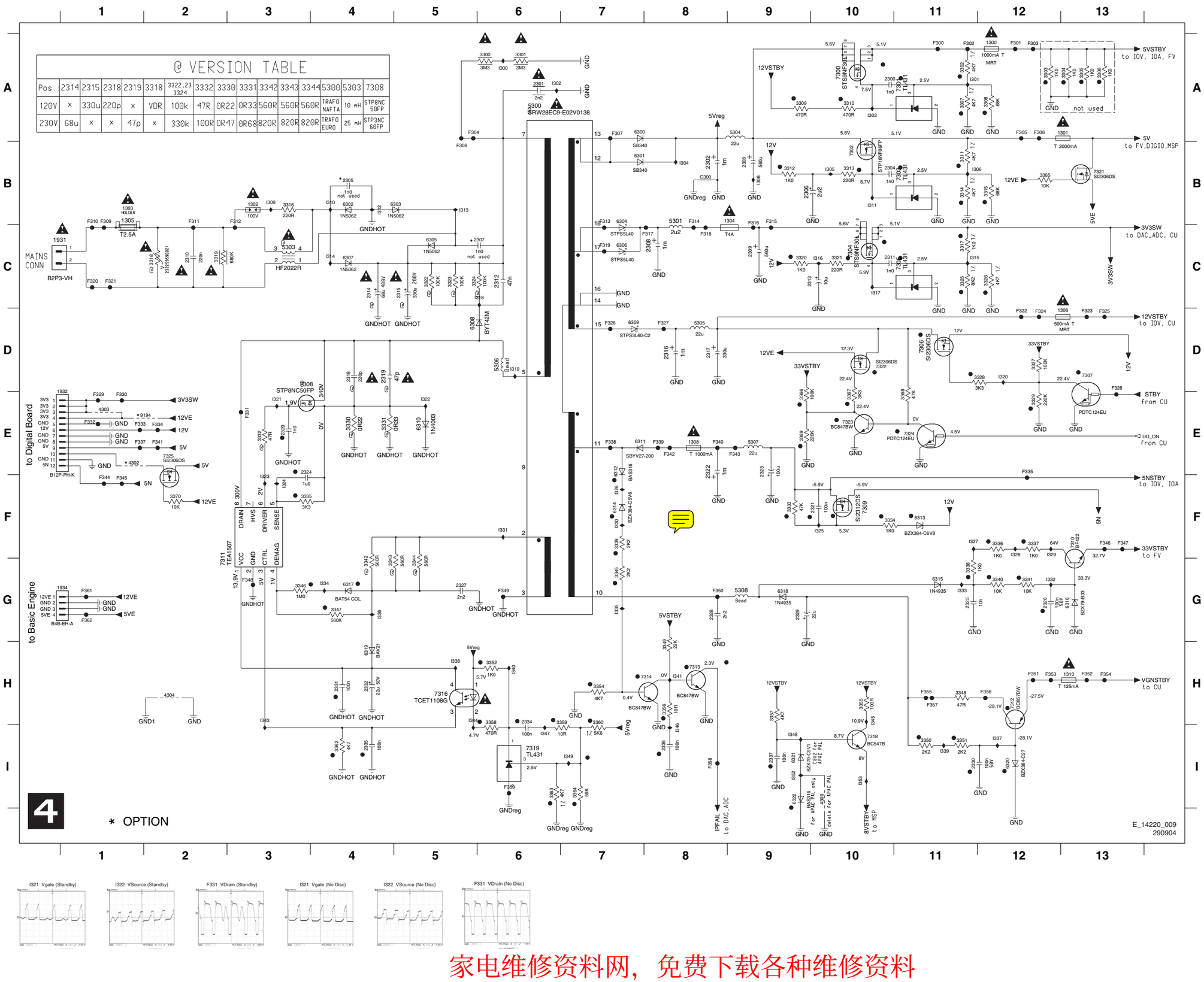
MOBO: Power Supply (PS)

@ VERSION TABLE														
Pos.	2314	2315	2318	2319	3318	3322,23 3324	3332	3330	3331	3342	3343	3344	5300	5303	7308
120V	x	330u	220p	x	VDR	100k	47R	0R22	0R33	560R	560R	560R	TRAFO NAFTA	10 mH	STP8NC 50FP
230V	68u	x	x	47p	x	330k	100R	0R47	0R68	820R	820R	820R	TRAFO EURO	25 mH	STP3NC 60FP



1300 A12	3370 F2	F357 H11
1301 A13	4300 I10	F358 I8
1302 B3	4302 E1	F359 I6
1303 B1	4303 E1	F361 G1
1304 B9	4304 H2	F362 G1
1305 B1	5300 A6	I300 A6
1306 D13	5301 B8	I301 A11
1308 E8	5303 C3	I302 A6
1310 H13	5304 A9	I303 A10
1931 C1	5305 D8	I304 B8
1932 E1	5306 D6	I305 B10
1934 G1	5307 E9	I306 B11
2300 A10	5308 G9	I308 B9
2301 A6	6300 A7	I309 B3
2302 B8	6301 B7	I310 B4
2303 B9	6302 B4	I311 B10
2304 B10	6303 B5	I312 B4
2305 B4	6304 B7	I313 B5
2306 B9	6305 C5	I314 C4
2307 C6	6306 C7	I315 C11
2308 C8	6307 C4	I316 C10
2309 C9	6308 D5	I317 C10
2310 C2	6309 D7	I318 C6
2311 C10	6310 E5	I319 D6
2312 C6	6311 E7	I320 D12
2313 C10	6312 E7	I321 E3
2314 C4	6313 F11	I322 E5
2315 C5	6314 F7	I323 F3
2316 D8	6315 G11	I324 F3
2317 D8	6316 G13	I325 F10
2318 D4	6317 G4	I326 F7
2319 D4	6318 G9	I327 F11
2320 E3	6319 H4	I328 F12
2321 F10	6320 I12	I329 F12
2322 E8	6321 I9	I330 F7
2323 E9	6322 I9	I331 F6
2324 E3	7300 A10	I332 G12
2325 G11	7301 A11	I333 G11
2326 G12	7302 B10	I334 G4
2327 G5	7303 B11	I335 G7
2328 G8	7304 C10	I336 G4
2329 G9	7305 C11	I337 I12
2330 I11	7306 D11	I338 H5
2331 H4	7307 D13	I339 I11
2332 H4	7308 D3	I340 H6
2334 H6	7309 F10	I341 H8
2335 I4	7310 F13	I343 H3
2336 I8	7311 G2	I344 H5
2337 I9	7312 H12	I345 H10
3300 A6	7313 H8	I346 I8
3301 A6	7314 H7	I347 I6
3302 A11	7316 H5	I348 I9
3303 A12	7318 I10	I349 I7
3304 A13	7319 I6	I352 I9
3305 A13	7321 B13	I353 I10
3306 A13	7322 D10	
3307 A11	7323 E10	
3308 A12	7324 E11	
3309 A9	7325 E2	
3310 A10	9194 E2	
3311 B11	C300 B8	
3312 B9	F300 A11	
3313 B10	F301 A12	
3314 B11	F302 A11	
3315 B12	F303 A12	
3316 B3	F304 A5	
3317 C11	F305 A12	
3318 C2	F306 A12	
3319 C2	F307 A7	
3320 C9	F308 B5	
3321 C10	F309 B1	
3322 C5	F310 B1	
3323 C5	F311 B2	
3324 C5	F312 B3	
3325 C11	F313 B7	
3326 C12	F314 B8	
3327 D12	F315 B9	
3328 D12	F316 B9	
3329 E12	F317 C8	
3330 E4	F318 C8	
3331 E4	F319 C7	
3332 E3	F320 C1	
3333 F9	F321 C1	
3334 F10	F322 D12	
3335 F3	F323 D13	
3336 F12	F324 D12	
3337 F12	F325 D13	
3338 G11	F326 D7	
3339 F7	F327 D8	
3340 G12	F328 D13	
3341 G12	F329 E1	
3342 G4	F330 E1	
3343 G4	F331 E3	
3344 G5	F332 E1	
3345 G7	F333 E1	
3346 G3	F334 E2	
3347 G4	F335 E12	
3348 H11	F337 E1	
3349 H8	F338 E7	
3350 I11	F339 E8	
3351 I11	F340 E8	
3352 H6	F341 E2	
3354 H7	F342 E8	
3355 H10	F343 E9	
3356 H8	F344 F1	
3357 H9	F345 F1	
3358 H6	F346 F13	
3359 H7	F347 F13	
3360 H7	F348 G3	
3362 I4	F349 G6	
3363 I6	F350 G8	
3364 I7	F351 H12	
3365 B12	F352 H13	
3366 E9	F353 H12	
3367 E10	F354 H13	
3368 E11	F355 H11	
3369 E9	F356 H12	

I321 Vgate (Standby)

I322 VSource (Standby)

F331 VDrain (Standby)

I321 Vgate (No Disc)

I322 VSource (No Disc)

F331 VDrain (No Disc)

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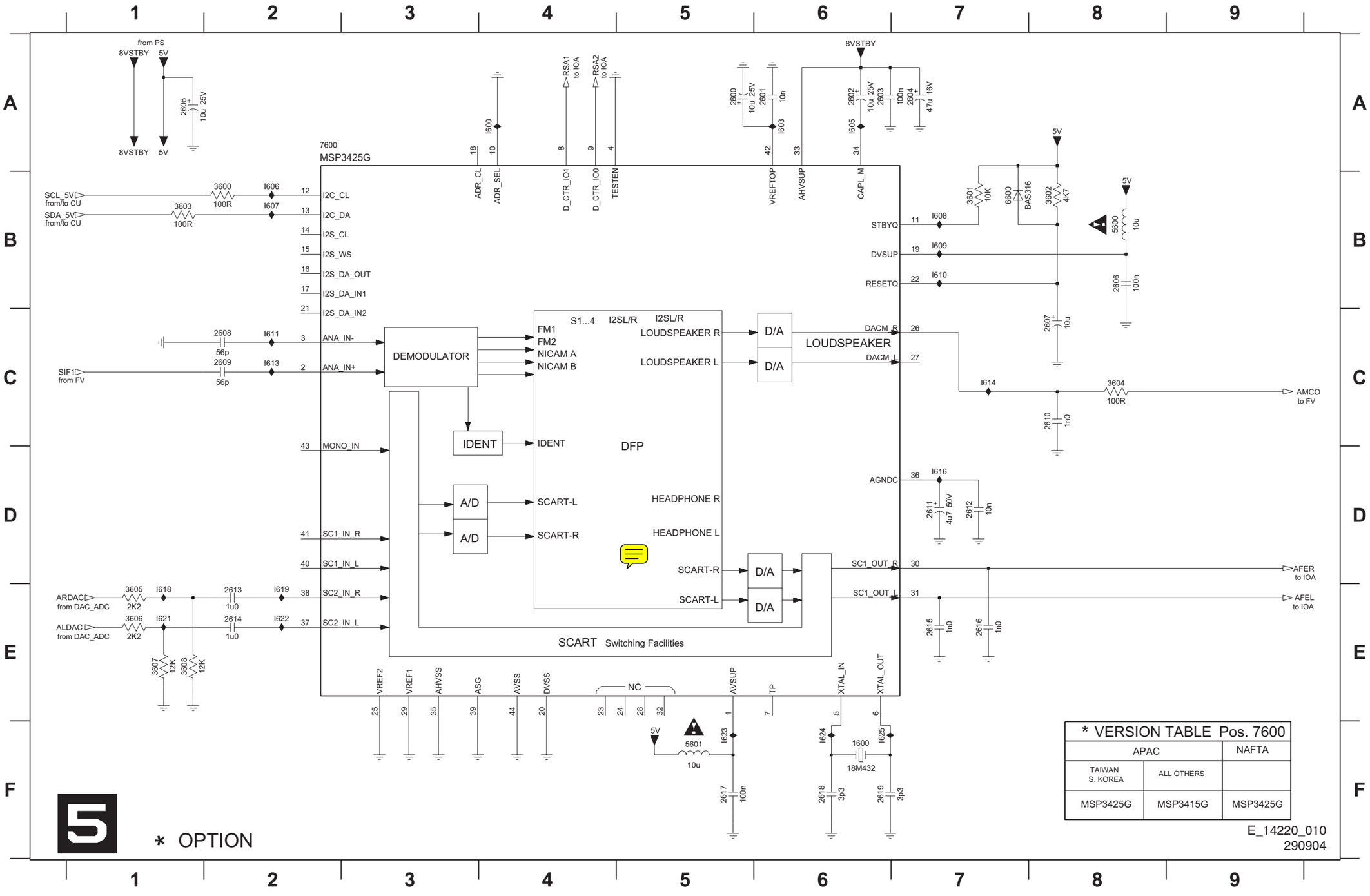
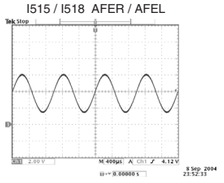
MOBO: Multi Sound Processing (MSP)

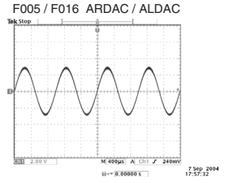


1600 F6
2600 A5
2601 A6
2602 A6
2603 A6
2604 A7
2605 A1
2606 B8
2607 C8
2608 C2
2609 C2
2610 C8
2611 D7
2612 D7
2613 E2
2614 E2
2615 E7
2616 E7
2617 F5
2618 F6
2619 F6
3600 B2
3601 B7
3602 B8
3603 B1
3604 C8
3605 E1
3606 E1
3607 E1
3608 E1
5600 B8
5601 F5
6600 B7
7600 A2
I600 A4
I603 A6
I605 A6
I606 B2
I607 B2
I608 B7
I609 B7
I610 B7
I611 C2
I613 C2
I614 C7
I616 D7
I618 E1
I619 E2
I621 E1
I622 E2
I623 F5
I624 F6
I625 F6

I515 / I518 AFER / AFEL



F005 / F016 ARDAC / ALDAC



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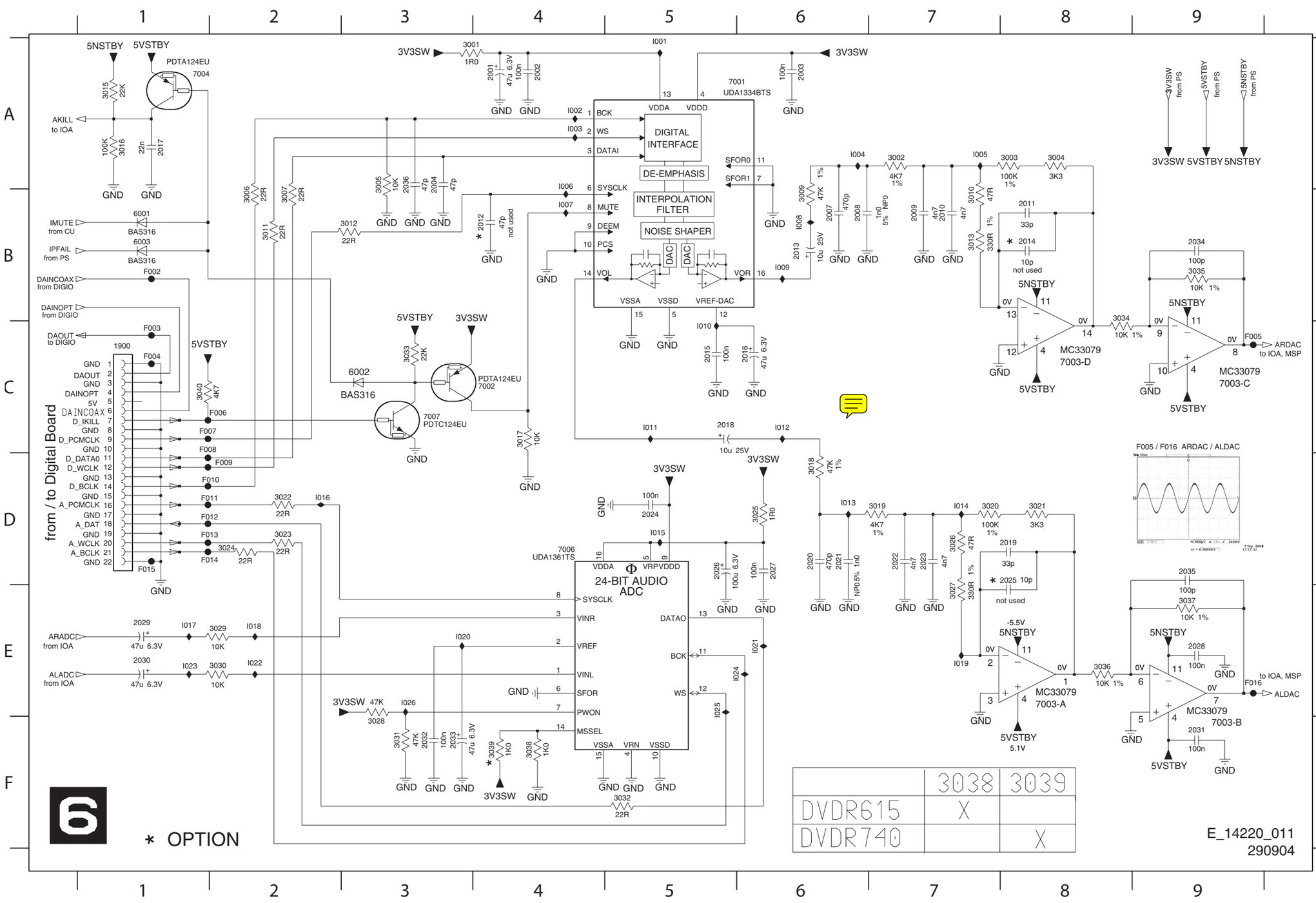
MOBO: Audio Converter (DAC_ADC)



	3038	3039
DVDR615	X	
DVDR740		X

1900 C1
2001 A4
2002 A4
2003 A6
2004 A3
2007 B6
2008 B6
2009 B7
2010 B7
2011 B8
2012 B4
2013 B6
2014 B8
2015 C5
2016 C6
2017 A1
2018 C5
2019 D8
2020 D6
2021 D6
2022 D7
2023 D7
2024 D5
2025 D8
2026 D5
2027 D6
2028 E9
2029 E1
2030 E1
2031 F9
2032 F3
2033 F3
2034 B9
2035 D9
2036 A3
3001 A3
3002 A7
3003 A8
3004 A8
3005 A3
3006 B2
3007 B2
3009 B6
3010 B7
3011 B2
3012 B3
3013 B7
3015 A1
3016 A1
3017 C4
3018 D6
3019 D7
3020 D7
3021 D8
3022 D2
3023 D2
3024 D2
3025 D6
3026 D7
3027 E7
3028 F3
3029 E2
3030 E2
3031 F3
3032 F5
3033 C3
3034 B8
3035 B9
3036 E8
3037 E9
3038 F4
3039 F4
3040 C1
6001 B1
6002 C3
6003 B1

7001 A6
7002 C4
7003-A E8
7003-B F9
7003-C C9
7003-D C8
7004 A2
7006 D4
7007 C3
F002 B1
F003 C1
F004 C1
F005 C9
F006 C2
F007 C1
F008 C1
F009 D2
F010 D2
F011 D2
F012 D2
F013 D2
F014 D2
F015 D1
F016 E9
I001 A5
I002 A4
I003 A4
I004 A6
I005 A7
I006 A4
I007 B4
I008 B6
I009 B6
I010 C5
I011 C5
I012 C6
I013 D6
I014 D7
I015 D5
I016 D2
I017 E1
I018 E2
I019 E7
I020 E3
I021 E6
I022 E2
I023 E1
I024 E5
I025 E5
I026 E3

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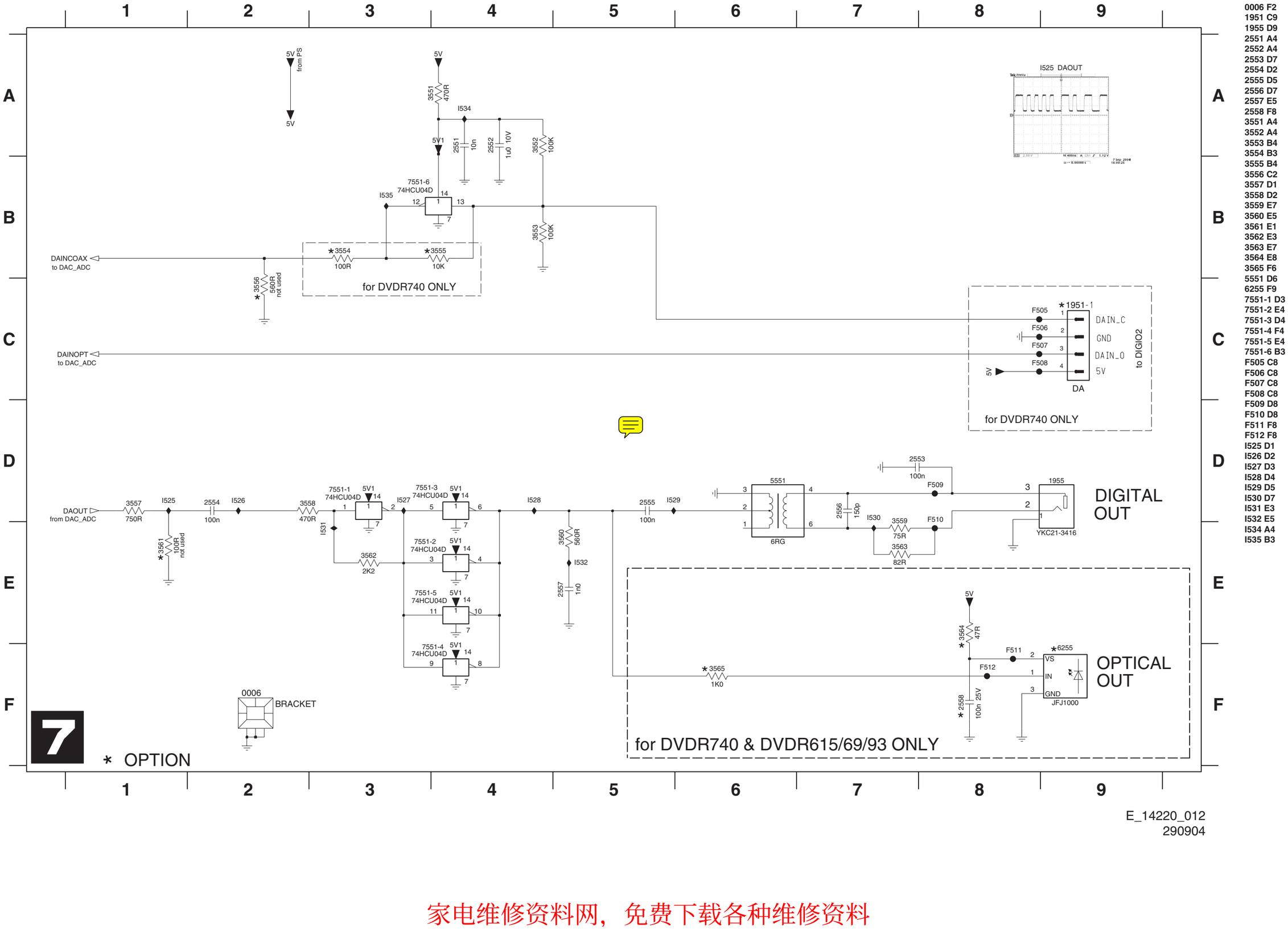
MOBO Board: Digital In/Out (DIGIO1)



0006 F2
1951 C9
1955 D9
2551 A4
2552 A4
2553 D7
2554 D2
2555 D5
2556 D7
2557 E5
2558 F8
3551 A4
3552 A4
3553 B4
3554 B3
3555 B4
3556 C2
3557 D1
3558 D2
3559 E7
3560 E5
3561 E1
3562 E3
3563 E7
3564 E8
3565 F6
5551 D6
6255 F9
7551-1 D3
7551-2 E4
7551-3 D4
7551-4 F4
7551-5 E4
7551-6 B3
F505 C8
F506 C8
F507 C8
F508 C8
F509 D8
F510 D8
F511 F8
F512 F8
I525 D1
I526 D2
I527 D3
I528 D4
I529 D5
I530 D7
I531 E3
I532 E5
I534 A4
I535 B3

E_14220_012
290904

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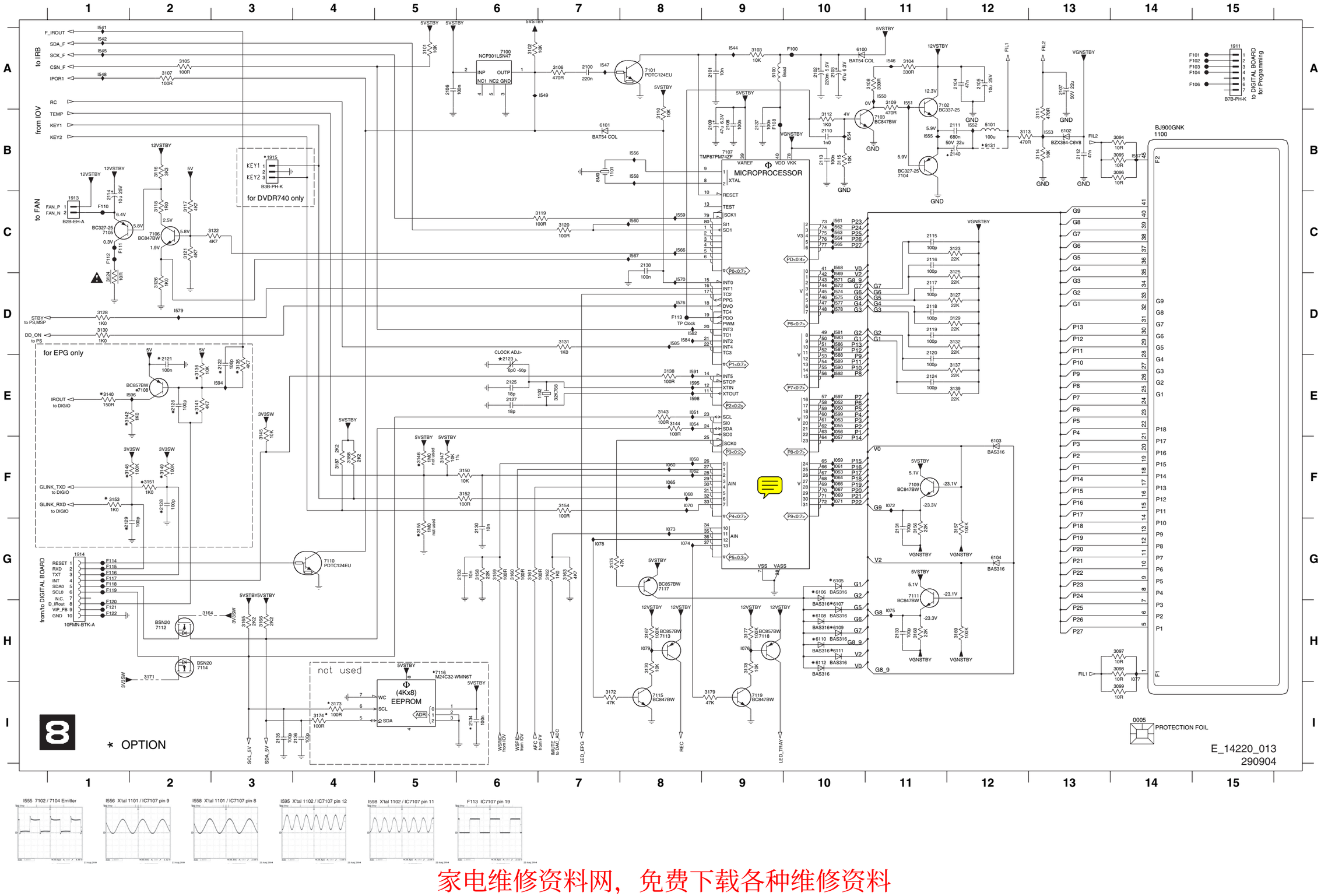
MOBO Board: Control Unit (CU)

0005 I14 2100 A7 2108 B9 2116 C11 2124 E11 2132 G6 3094 B14 3103 A9 3111 B13 3119 C7 3127 D12 3137 E12 3145 E3 3153 F1 3161 G6 3169 H12 3178 H9 6102 B13 6110 H10 7105 C1 7113 H8 F100 A10 F111 C1 F119 G1 I054 E8 I062 F8 I070 F8 I078 G7 I548 A1 I556 B8 I564 C10 I572 D10 I582 D8 I590 E10 I599 E10
1100 B14 2101 A9 2109 B9 2117 D11 2125 E6 2133 H11 3095 B14 3104 A11 3112 B10 3120 C7 3128 D1 3138 E8 3146 F5 3154 F7 3162 G7 3170 H8 3179 I9 6103 F12 6111 H10 7106 C2 7114 H2 F101 A15 F112 C1 F120 H1 I055 E10 I063 F10 I071 F10 I079 H8 I549 A7 I557 B14 I565 C10 I574 D10 I583 D10 I591 E8
1101 B7 2102 A10 2110 B10 2118 D11 2126 E2 2134 I6 3096 B14 3105 A2 3113 B12 3121 C2 3129 D12 3139 E12 3147 F5 3155 G5 3163 G7 3171 H2 3187 F4 6104 G12 6112 H10 7107 B9 7115 I8 F102 A15 F113 D8 F121 H1 I056 E10 I064 F10 I072 F11 I541 A1 I550 A11 I558 B8 I566 C8 I575 D10 I584 D8 I592 E10
1102 E7 2103 A10 2111 B12 2119 D11 2127 E6 2135 I3 3097 H14 3106 A7 3114 B13 3122 C3 3130 D1 3140 E1 3148 F1 3156 G11 3164 H2 3172 I7 3188 F4 6105 G10 7100 A6 7108 E2 7116 H5 F103 A15 F114 G1 F122 H1 I057 F10 I065 F8 I073 G8 I542 A1 I551 A11 I559 C8 I567 C8 I576 D8 I585 D8 I594 E3
1911 A15 2104 A12 2112 B13 2120 D11 2128 F2 2136 I4 3098 H14 3107 A2 3115 B10 3123 C12 3131 D7 3141 E2 3149 F2 3157 G12 3165 H3 3173 I4 5100 A9 6106 G10 7101 A8 7109 F11 7117 G8 F104 A15 F115 G1 F123 D8 I050 E10 I058 F8 I066 F10 I074 G8 I544 A9 I552 B12 I560 C8 I568 C10 I577 D10 I587 D10 I596 E2
1913 C1 2105 A12 2113 B10 2121 E2 2129 G1 2137 B9 3099 I14 3108 A11 3116 B2 3124 D1 3132 D12 3142 E1 3150 F6 3158 G6 3166 H3 3174 I4 5101 B12 6107 H10 7102 A11 7110 G4 7118 H9 9131 B12 F106 A15 F116 G1 I051 E8 I059 F10 I067 F10 I075 H11 I545 A1 I553 B13 I561 C10 I569 D10 I578 D10 I587 D10 I596 E2
1914 G1 2106 A5 2114 C1 2122 E3 2130 G6 2138 C8 3100 A5 3109 A11 3117 C2 3125 D12 3135 E3 3143 E8 3151 F2 3159 G6 3167 H8 3175 G7 6100 A10 6108 H10 7103 B11 7111 G11 7119 I9 F108 B9 F117 G1 I052 E10 I060 F8 I068 F8 I076 H9 I546 A11 I554 B10 I562 C10 I570 D8 I579 D2 I588 E10 I597 E10
1915 B3 2107 A13 2115 C11 2123 E6 2131 G11 2140 B12 3102 A6 3110 B8 3118 C2 3126 D2 3136 E2 3144 E8 3152 F6 3160 G6 3168 H11 3177 H9 6101 B7 6109 H10 7104 B11 7112 H2 F110 C1 F118 G1 I053 E10 I061 F10 I069 F10 I077 H14 I547 A7 I555 B11 I563 C10 I571 D10 I581 D10 I589 E10 I598 E8



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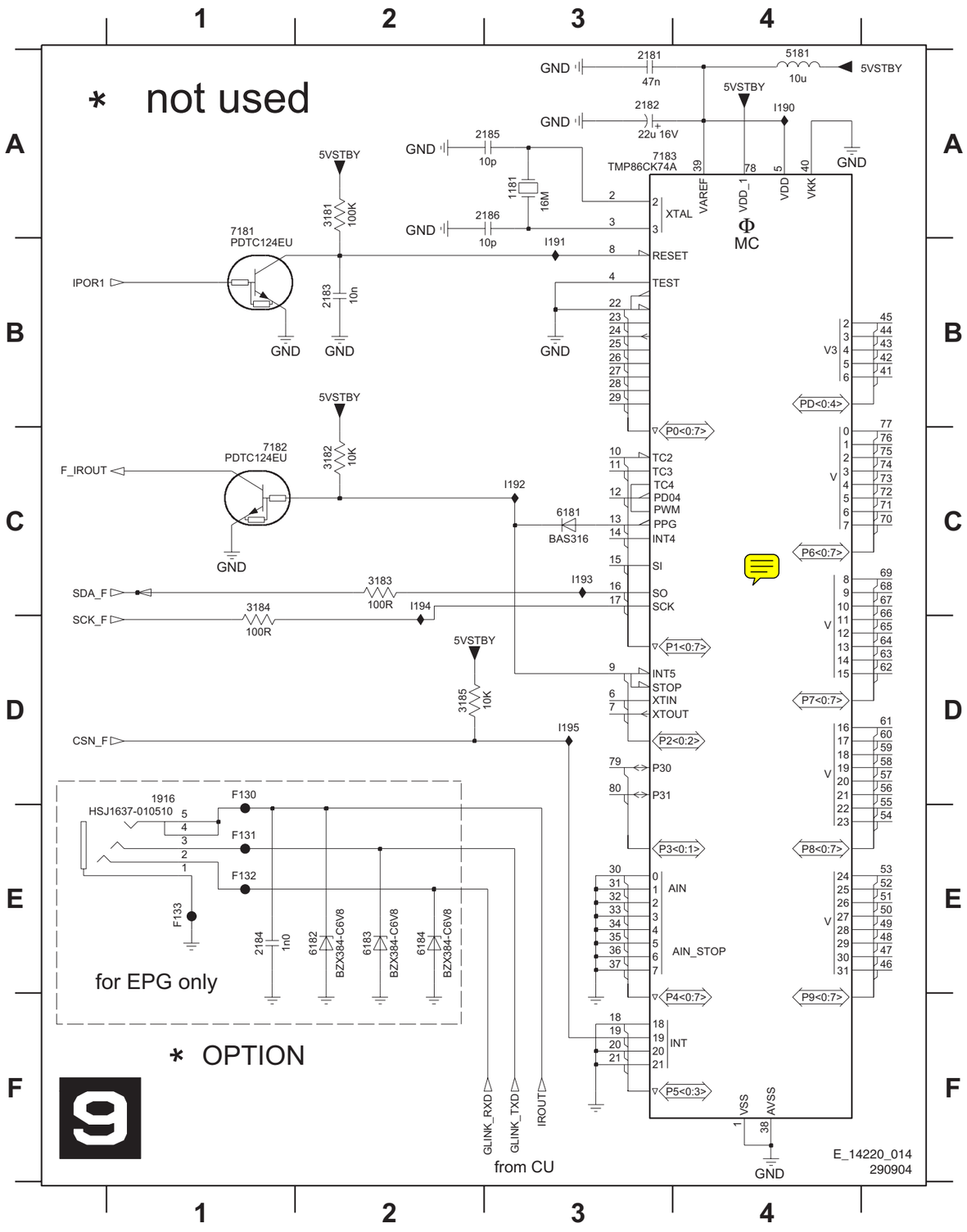
MOBO Board: IR Blaster (IRB)

1181 A3 2182 A3 2185 A3 3182 C2 3185 D2 6182 E2 7181 A1 F130 D1 F133 E1 I192 C3 I195 D3
1916 D1 2183 B2 2186 A3 3183 C2 5181 A4 6183 E2 7182 C1 F131 E1 I190 A4 I193 C3
2181 A3 2184 E1 3181 A2 3184 C1 6181 C3 6184 E2 7183 A4 F132 E1 I191 B3 I194 C2



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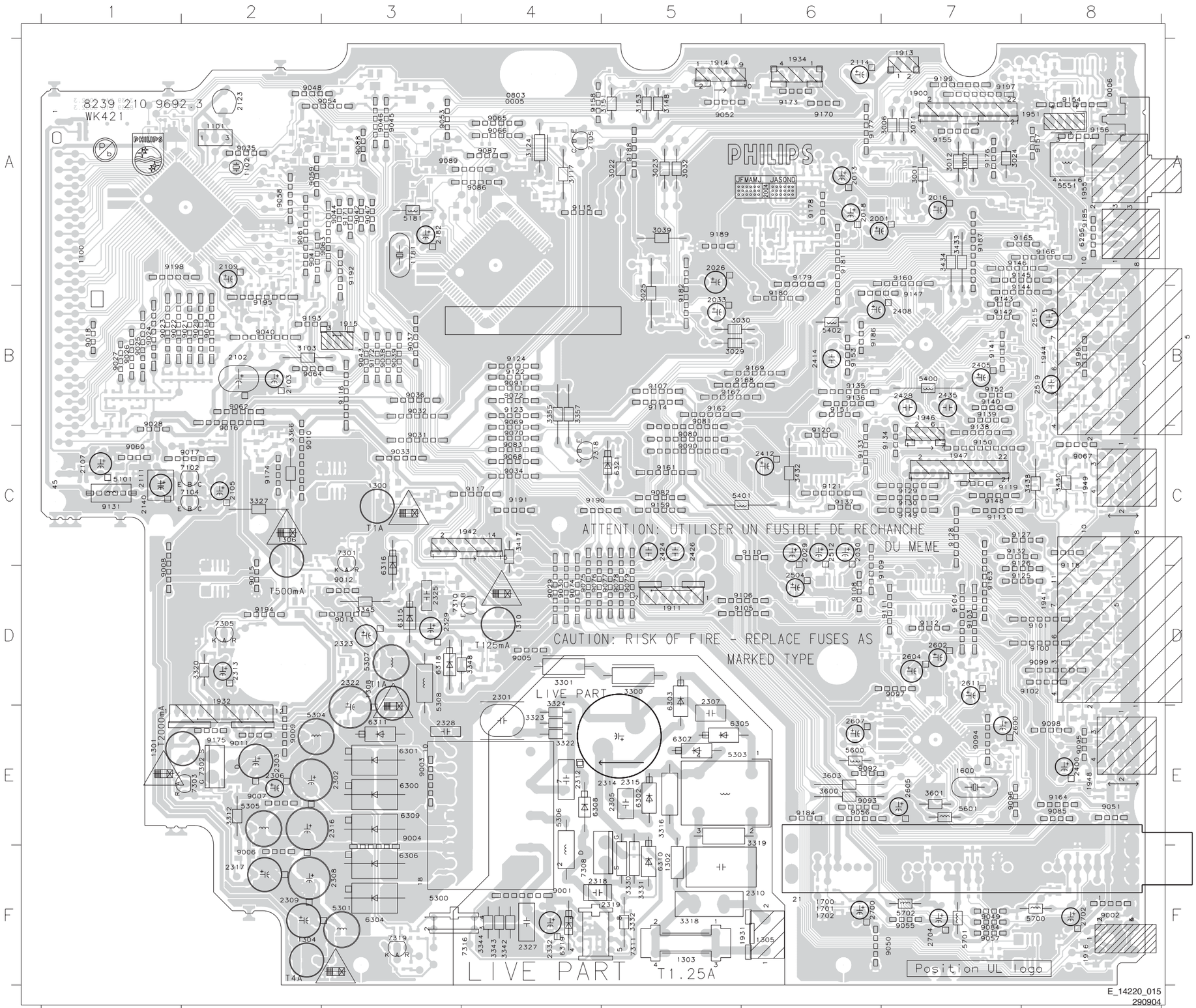
Layout: MOBO - Main Part (Top View)



0005 A4	3322 E4	9056 E6	9187 A7
0006 A8	3323 E4	9057 F7	9188 A5
0803 A4	3324 D4	9058 A2	9189 A5
1100 A1	3327 C2	9059 A2	9190 C4
1101 A2	3330 F5	9060 C1	9191 C4
1102 A2	3331 F5	9061 A2	9192 A3
1181 A3	3332 F5	9062 B2	9193 B2
1300 C3	3342 F4	9063 A3	9194 D2
1301 E1	3343 F4	9064 B2	9195 B2
1302 F5	3344 F4	9065 A4	9196 B8
1303 F5	3345 D3	9066 A4	9197 A7
1304 F2	3348 D4	9067 C8	9198 A1
1305 F6	3355 B4	9068 C4	9199 A7
1306 C2	3357 B4	9069 B4	
1308 D3	3366 C2	9070 C4	
1310 D4	3417 C4	9072 B4	
1600 E7	3430 C8	9074 D4	
1700 F6	3432 C6	9075 D4	
1701 F6	3433 A7	9076 D4	
1702 F6	3434 A7	9077 D5	
1900 A7	3438 C8	9078 D5	
1911 D5	3600 E6	9079 D5	
1913 A7	3601 E7	9080 C5	
1914 A5	3603 E6	9081 B5	
1915 B3	5101 C1	9082 C5	
1916 F8	5181 A3	9083 C4	
1931 F6	5300 F3	9084 F7	
1932 D2	5301 F3	9085 E8	
1934 A6	5303 E5	9086 A4	
1941 D8	5304 E2	9087 A4	
1942 C4	5305 E2	9088 A3	
1944 B8	5306 E4	9089 A3	
1946 B7	5307 D3	9090 C5	
1947 C7	5308 D3	9091 B4	
1948 E8	5400 B7	9092 E6	
1949 C8	5401 C6	9093 E6	
1951 A8	5402 B6	9094 E7	
1955 A8	5551 A8	9095 E8	
2001 A6	5600 E6	9096 E7	
2013 A6	5601 E7	9097 D7	
2016 A7	5700 F8	9098 E8	
2018 A6	5701 F7	9099 D8	
2026 A5	5702 F7	9100 D8	
2029 C6	6255 A8	9101 D8	
2030 C6	6300 E3	9102 D8	
2033 B5	6301 E3	9103 D7	
2102 B2	6302 E5	9104 D7	
2103 B2	6303 D5	9105 D6	
2105 C2	6304 F3	9106 D6	
2107 C1	6305 E5	9107 B5	
2109 A2	6306 F3	9108 D6	
2111 C1	6307 E5	9109 D6	
2114 A6	6308 E4	9110 C6	
2123 A2	6309 E3	9111 D7	
2140 C1	6310 F5	9112 D7	
2182 A3	6311 E3	9113 C7	
2301 D4	6315 D3	9114 B5	
2302 E3	6316 D3	9115 A4	
2303 E3	6318 D3	9116 B3	
2305 E5	6319 F4	9117 C4	
2306 E2	6321 C5	9118 C8	
2307 D5	7102 C2	9119 C7	
2308 F3	7104 C2	9120 C6	
2309 F2	7105 A4	9121 C6	
2310 F6	7301 C3	9122 B4	
2312 E4	7302 E2	9123 B4	
2313 D2	7303 E2	9124 B4	
2314 E5	7305 D2	9125 D7	
2315 E5	7308 F4	9126 C7	
2316 E3	7310 D3	9127 C7	
2317 F2	7311 F5	9128 C7	
2318 F4	7316 F4	9129 C7	
2319 F5	7318 C4	9130 C7	
2322 D3	7319 F3	9131 C1	
2323 D3	9001 F4	9132 C7	
2325 D3	9002 F8	9133 C6	
2327 F4	9003 E3	9134 C7	
2328 B3	9004 E3	9135 B6	
2329 D3	9005 D4	9136 B6	
2332 F4	9006 F2	9137 C6	
2400 E8	9007 E2	9138 C7	
2405 B7	9008 D1	9139 B7	
2408 B7	9009 E2	9140 B7	
2412 C6	9010 C2	9141 B7	
2414 B6	9011 E2	9142 B7	
2424 C5	9012 D3	9143 B7	
2426 C5	9013 D3	9144 B7	
2428 B7	9015 D2	9145 A7	
2435 B7	9016 C2	9146 A7	
2504 D6	9017 C2	9147 B7	
2512 C6	9018 B1	9148 C7	
2515 B8	9019 B2	9149 C7	
2519 B8	9020 B2	9150 C7	
2600 E7	9021 B2	9151 B6	
2602 D7	9022 B1	9152 B7	
2604 D7	9023 B1	9153 B6	
2605 E7	9024 B1	9154 A8	
2607 E6	9025 B1	9155 A7	
2611 D7	9026 B1	9156 A8	
2700 F6	9027 B1	9157 A8	
2702 F8	9028 B1	9158 A4	
2704 F7	9029 D4	9159 C5	
3001 A7	9030 D4	9160 A7	
3006 A7	9031 C3	9161 C5	
3007 A7	9032 B3	9162 B5	
3011 A7	9033 C3	9163 D7	
3012 A7	9034 C4	9164 E8	
3022 A5	9035 A2	9165 A8	
3023 A5	9036 B3	9166 A8	
3024 A7	9037 B3	9167 B5	
3025 B5	9038 B3	9168 B6	
3029 B5	9039 B3	9169 B6	
3030 B5	9040 B2	9170 A6	
3032 A5	9041 A2	9171 A3	
3039 A5	9042 A3	9172 B3	
3103 B2	9043 B3	9173 A6	
3117 A4	9044 A3	9174 C2	
3124 A4	9045 A3	9175 E2	
3148 A5	9046 A3	9176 A7	
3151 A5	9047 A3	9177 A6	
3153 A5	9048 A2	9178 A6	
3300 D5	9049 F7	9179 A6	
3301 D4	9050 F7	9180 B6	
3312 E2	9051 E8	9181 A6	
3316 E5	9052 A5	9182 B5	
3318 F5	9053 A3	9184 E6	
3319 E6	9054 A3	9185 A8	
3320 D2	9055 F7	9186 B6	

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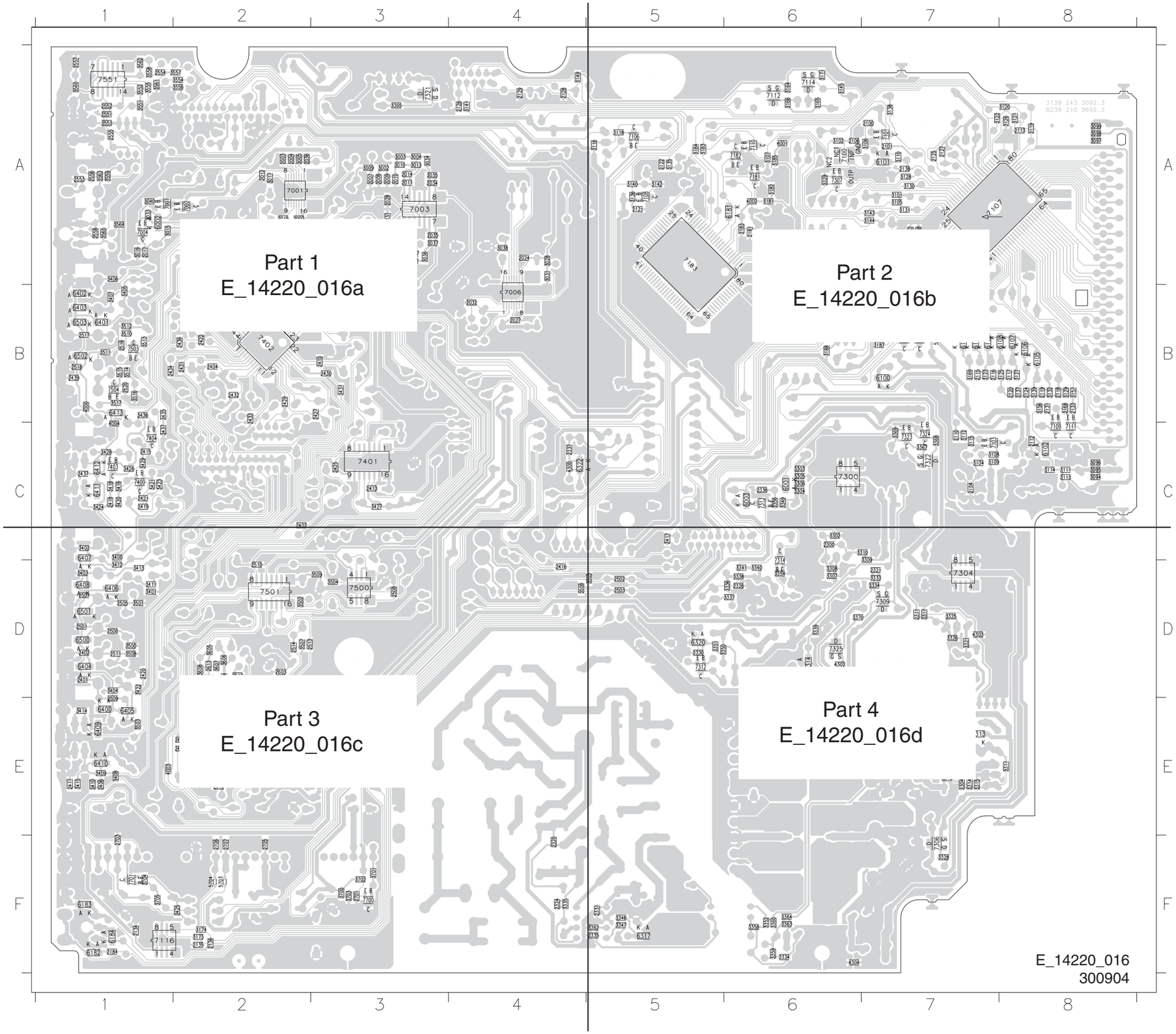
Layout: MOBO - Main Part (Bottom View)



2002	A2	2557	A1	3188	B6	4002	A6
2003	A2	2558	A1	3302	C6	4003	E1
2004	A2	2601	E2	3303	C6	4004	C1
2007	A3	2603	D2	3304	C6	4300	C4
2008	A3	2606	E3	3305	C6	4302	D6
2009	A3	2608	E2	3306	C6	4303	D7
2010	A3	2609	E2	3307	D6	4304	F6
2011	A3	2610	E3	3308	D6	5100	B7
2012	A2	2612	D2	3309	C7	5703	F2
2014	A3	2613	D2	3310	C7	5704	F2
2015	A2	2614	D2	3311	E8	6001	C6
2017	A1	2615	D2	3313	E7	6002	A1
2019	A3	2616	E2	3314	E7	6003	C6
2020	A3	2617	E2	3315	E7	6100	B7
2021	A3	2618	E2	3317	D7	6101	A7
2022	A3	2619	E2	3321	D7	6102	C8
2023	A3	2701	F3	3325	D7	6103	B7
2024	A4	2703	F1	3326	D7	6104	B7
2025	A3	2705	F2	3328	F7	6105	B8
2027	B4	2706	F2	3329	A6	6106	B8
2028	A3	2707	F2	3333	D7	6107	B8
2031	A3	3002	A3	3334	D7	6108	B8
2032	B4	3003	A3	3335	F4	6109	B7
2034	A3	3004	A3	3336	D6	6110	B7
2035	A3	3005	A2	3337	D6	6111	B7
2036	A2	3009	A3	3338	D6	6112	B7
2100	A7	3010	A3	3339	D6	6181	A6
2101	A7	3013	A3	3340	D6	6182	F1
2104	C7	3015	A1	3341	D6	6183	F1
2106	A6	3016	A1	3346	F5	6184	F1
2108	B7	3017	A2	3347	F5	6312	E6
2110	C7	3018	A3	3349	C6	6313	E7
2112	C8	3019	A3	3350	D5	6314	D6
2113	A8	3020	A3	3351	D5	6317	F5
2115	B7	3021	A3	3352	F6	6320	D5
2116	B7	3026	A3	3354	D6	6322	C4
2117	B8	3027	A3	3356	C6	6400	E1
2118	B8	3028	A4	3358	F6	6401	B1
2119	B8	3031	A4	3359	F6	6402	B1
2120	B8	3033	A1	3360	F6	6403	B1
2121	A5	3034	A3	3362	F5	6404	D1
2122	A5	3035	A3	3363	F6	6405	E1
2124	B8	3036	A3	3364	F6	6406	D1
2125	A7	3037	A3	3365	A3	6407	C1
2126	A4	3038	A4	3367	C7	6408	D1
2127	A7	3040	A1	3368	C7	6409	E1
2128	A4	3094	C8	3369	C7	6410	E1
2129	A4	3095	C8	3370	D6	6411	C1
2130	A7	3096	C8	3400	C1	6412	C1
2131	B8	3097	A8	3401	D1	6413	B1
2132	A7	3098	A8	3402	C1	6500	D1
2133	B8	3099	A8	3403	D1	6501	D1
2134	F1	3101	A7	3404	D1	6502	B1
2135	F2	3102	A6	3405	B1	6503	B1
2136	F2	3104	C7	3406	A1	6600	E3
2137	B7	3105	A7	3407	B1	7001	A2
2138	A7	3106	A7	3408	E1	7002	A2
2181	A6	3107	A6	3409	E1	7003	A3
2183	A6	3108	C7	3410	E1	7004	A1
2184	F1	3109	C7	3411	D1	7006	B4
2185	A6	3110	A7	3412	D1	7007	A1
2186	A6	3111	C8	3413	D1	7100	A6
2300	C6	3112	C7	3414	E1	7101	A7
2304	E7	3113	C8	3415	E1	7103	C7
2311	D7	3114	C8	3416	C1	7106	A5
2320	F4	3115	C7	3418	C1	7107	A7
2321	D7	3116	A5	3419	A7	7108	A5
2324	F4	3118	A5	3420	C1	7109	C8
2326	D6	3119	A8	3421	C1	7110	A6
2330	D5	3120	A8	3422	D1	7111	C8
2331	F5	3121	A8	3423	C1	7112	A6
2334	F6	3122	A7	3424	C1	7113	B7
2335	F5	3123	B7	3425	F2	7114	A6
2336	C6	3125	B8	3426	C1	7115	B7
2337	C4	3126	A8	3427	C3	7116	F1
2401	D1	3127	B8	3428	C1	7117	B7
2402	D1	3128	A7	3429	C1	7118	B7
2403	A2	3129	B8	3431	B3	7119	B7
2404	B2	3130	A7	3435	B1	7181	A6
2406	E1	3131	A7	3436	B1	7182	A6
2407	C2	3132	B8	3437	C1	7183	A5
2409	B2	3135	A5	3500	D1	7300	C6
2410	B3	3136	A5	3501	D1	7304	D7
2411	E1	3137	B8	3502	D2	7306	F7
2413	C3	3138	A7	3503	E1	7307	A6
2415	C1	3139	B8	3504	D3	7309	D7
2416	D4	3140	A5	3505	D5	7312	D5
2417	C5	3141	A4	3506	D4	7313	C6
2418	C1	3142	A5	3507	D2	7314	D6
2419	C1	3143	A7	3508	D1	7321	A3
2420	D1	3144	A7	3509	D3	7322	C7
2421	C1	3145	A6	3510	B1	7323	C7
2422	B2	3146	B7	3511	B1	7324	C7
2423	B2	3147	B7	3512	B1	7325	D6
2425	C3	3149	A4	3513	B1	7400	C1
2427	B3	3150	B7	3514	B1	7401	C3
2429	B2	3152	A7	3515	B1	7402	B2
2430	B3	3154	A7	3516	B1	7403	C1
2431	B2	3155	B7	3517	B1	7404	C1
2432	B2	3156	B8	3551	A1	7500	D3
2433	B2	3157	B8	3552	A1	7501	D2
2434	B1	3158	A7	3553	A1	7503	B1
2436	B2	3159	A7	3554	A2	7504	B1
2437	C1	3160	A7	3555	A1	7551	A1
2438	A2	3161	A7	3556	A2	7600	E2
2439	B1	3162	A7	3557	A2	7700	F3
2500	D1	3163	A7	3558	A1	7701	F1
2501	D1	3164	A6	3559	A1		
2502	D5	3165	A6	3560	A1		
2503	D5	3166	A6	3561	A1		
2505	D1	3167	B7	3562	A1		
2507	D1	3168	B8	3563	A1		
2508	D3	3169	B7	3564	A1		
2509	E1	3170	B7	3565	A1		
2510	D2	3171	A6	3602	E3		
2511	D1	3172	A7	3604	E3		
2513	D2	3173	F2	3605	D2		
2514	D2	3174	F2	3606	D2		
2516	B1	3175	A7	3607	D2		
2517	B1	3177	B7	3608	D2		
2518	B1	3178	B7	3700	F3		
2520	B1	3179	A7	3701	F3		
2551	A1	3181	A6	3702	F3		
2552	A1	3182	A6	3703	F3		
2553	A1	3183	A5	3704	F1		
2554	A1	3184	A5	3705	F1		
2555	A1	3185	A6	4000	B1		
2556	A1	3187	B7	4001	A6		

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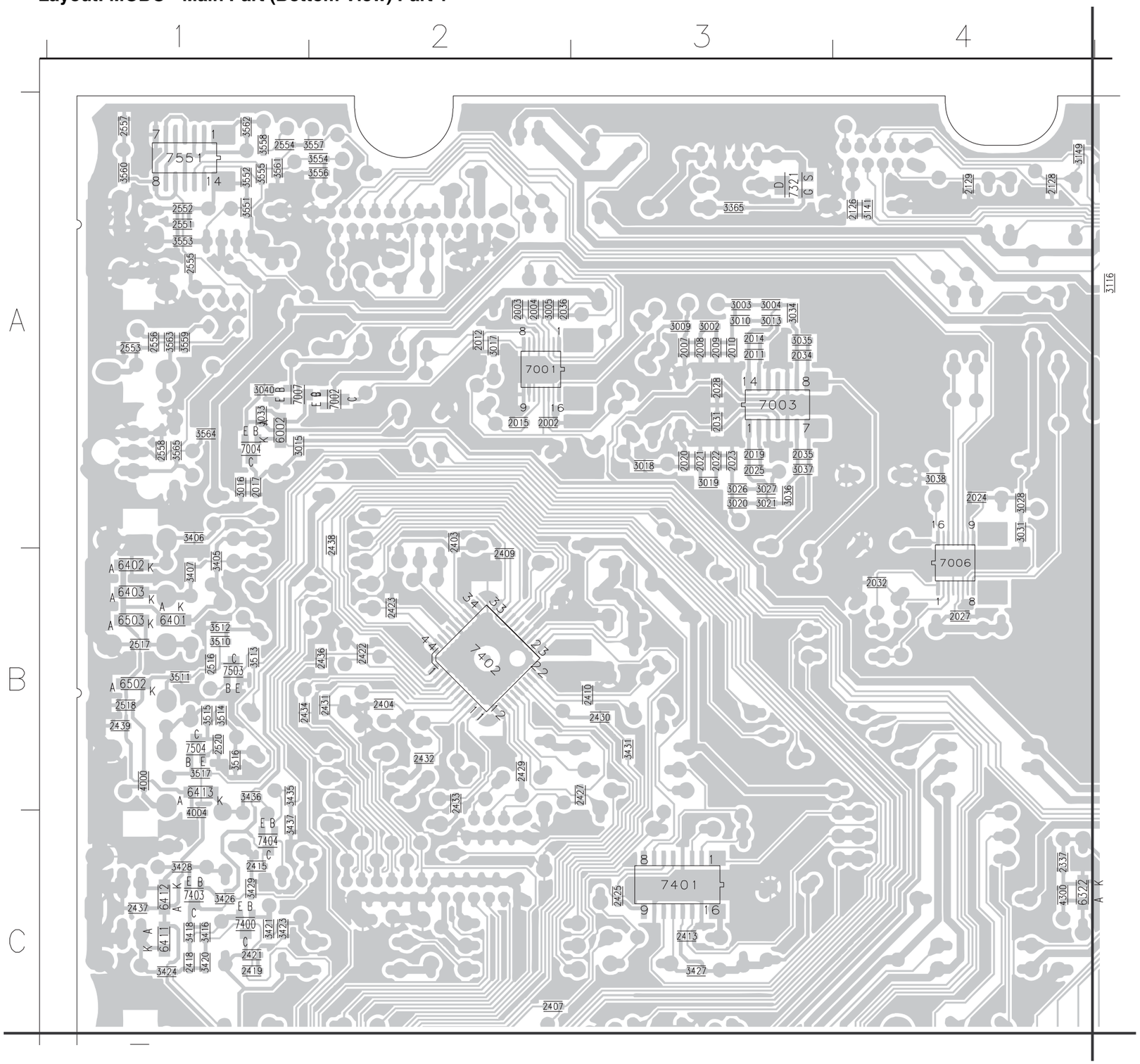
Layout: MOBO - Main Part (Bottom View) Part 1



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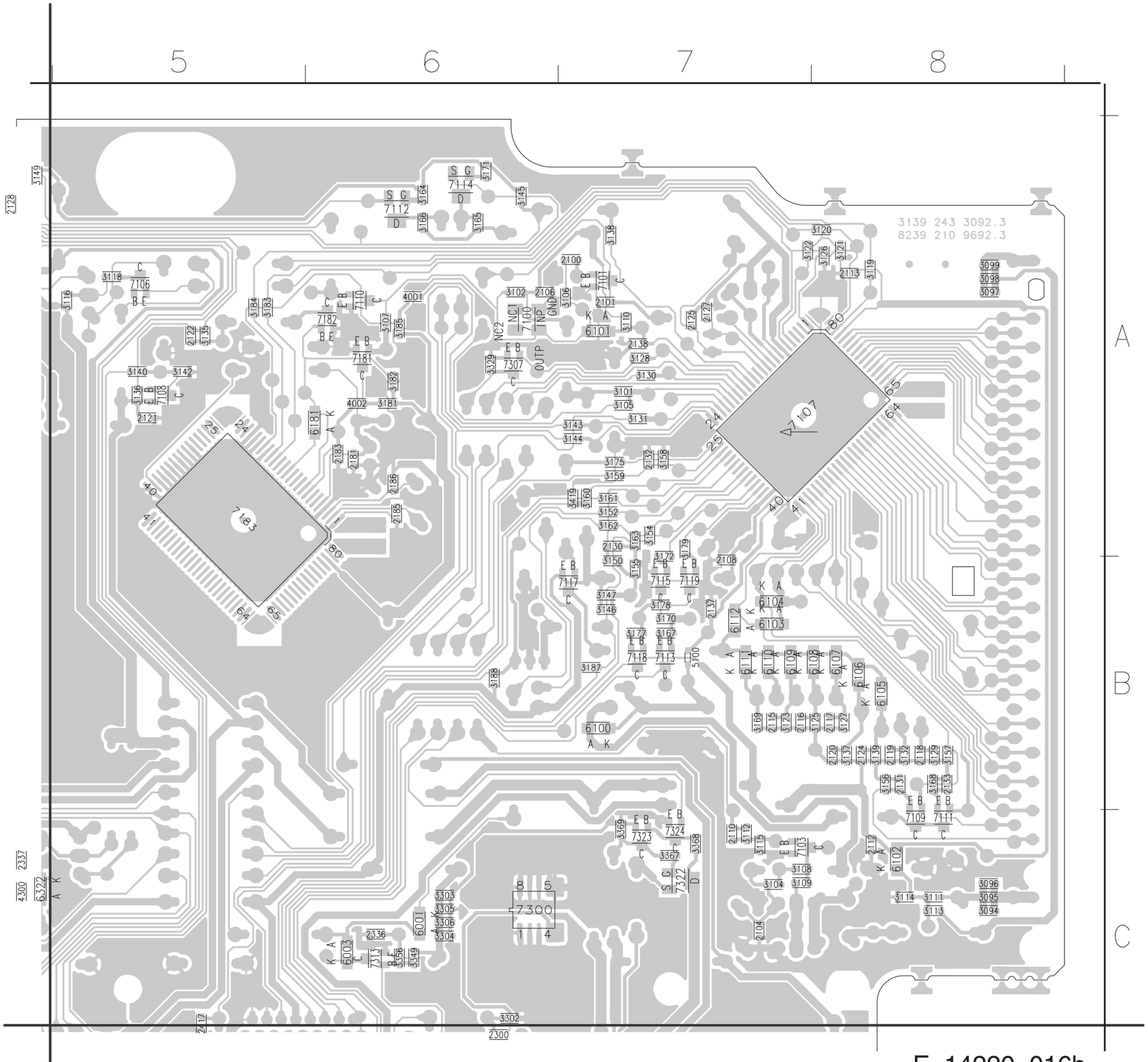
Layout: MOBO - Main Part (Bottom View) Part 2



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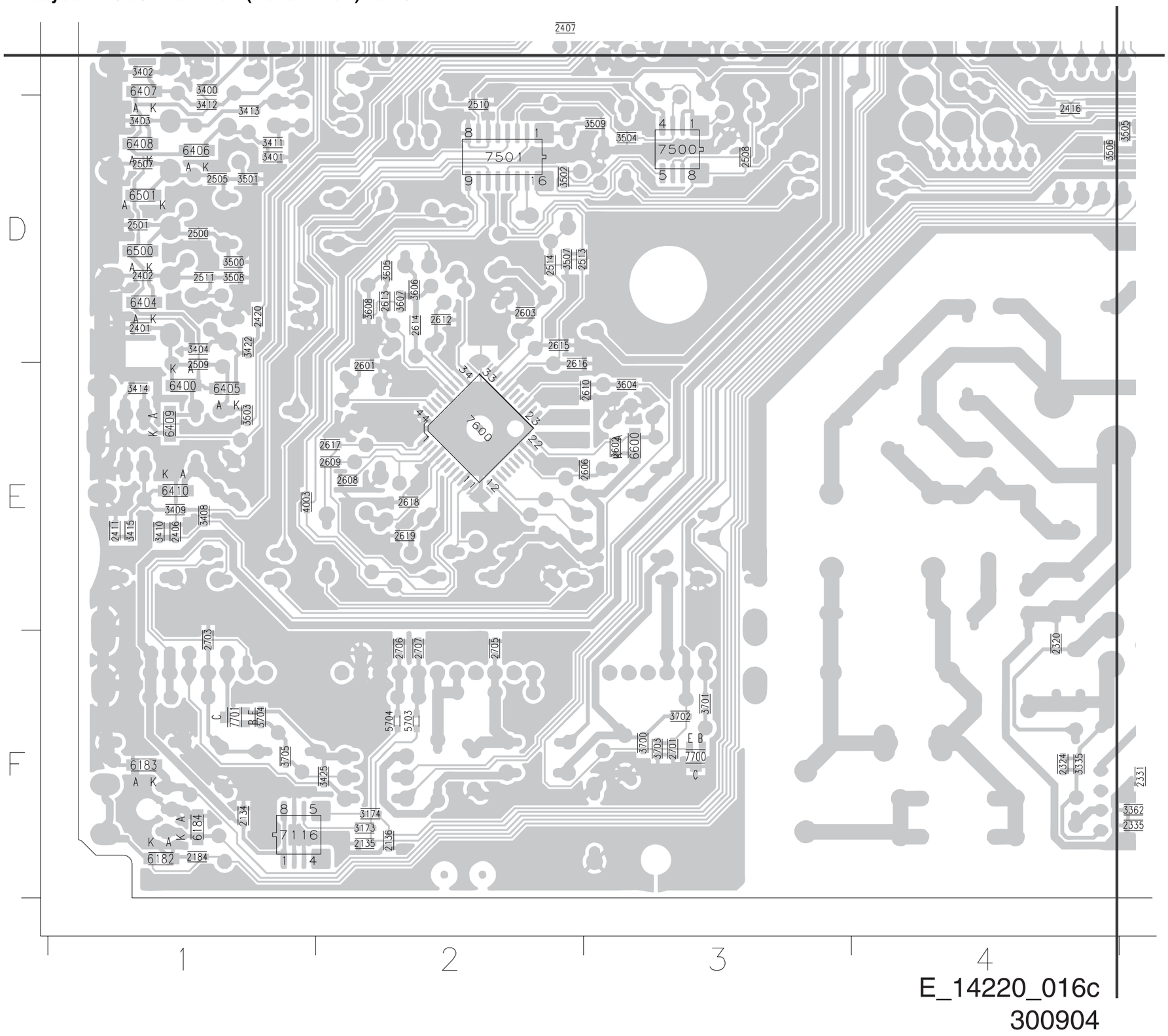
http://www.jdwxzlw.com/?fromuser=华盛维修

Layout: MOBO - Main Part (Bottom View) Part 3



E_14220_016c
300904

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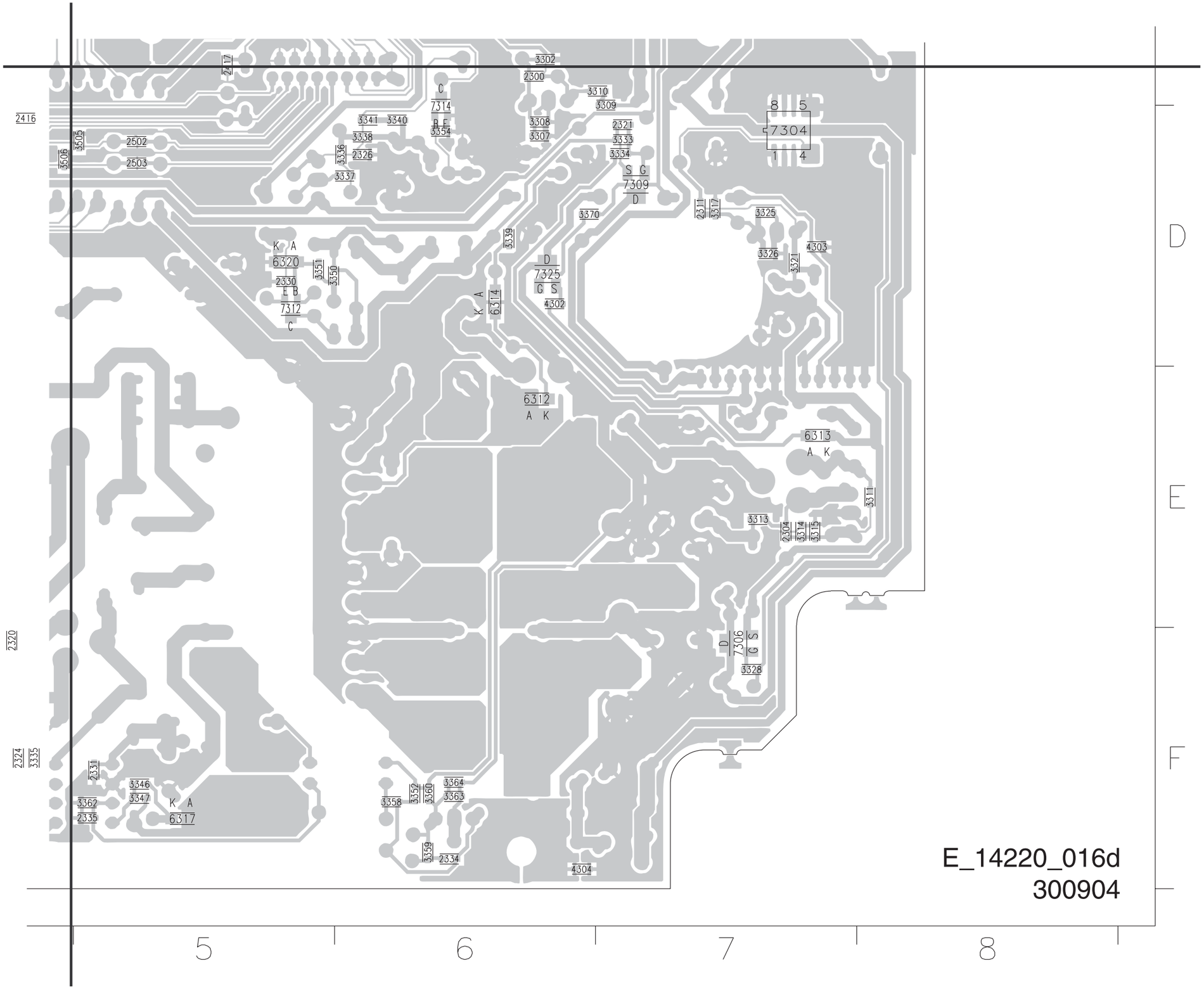
http://www.jdwxzlw.com/?fromuser=华盛维修

Layout: MOBO - Main Part (Bottom View) Part 4



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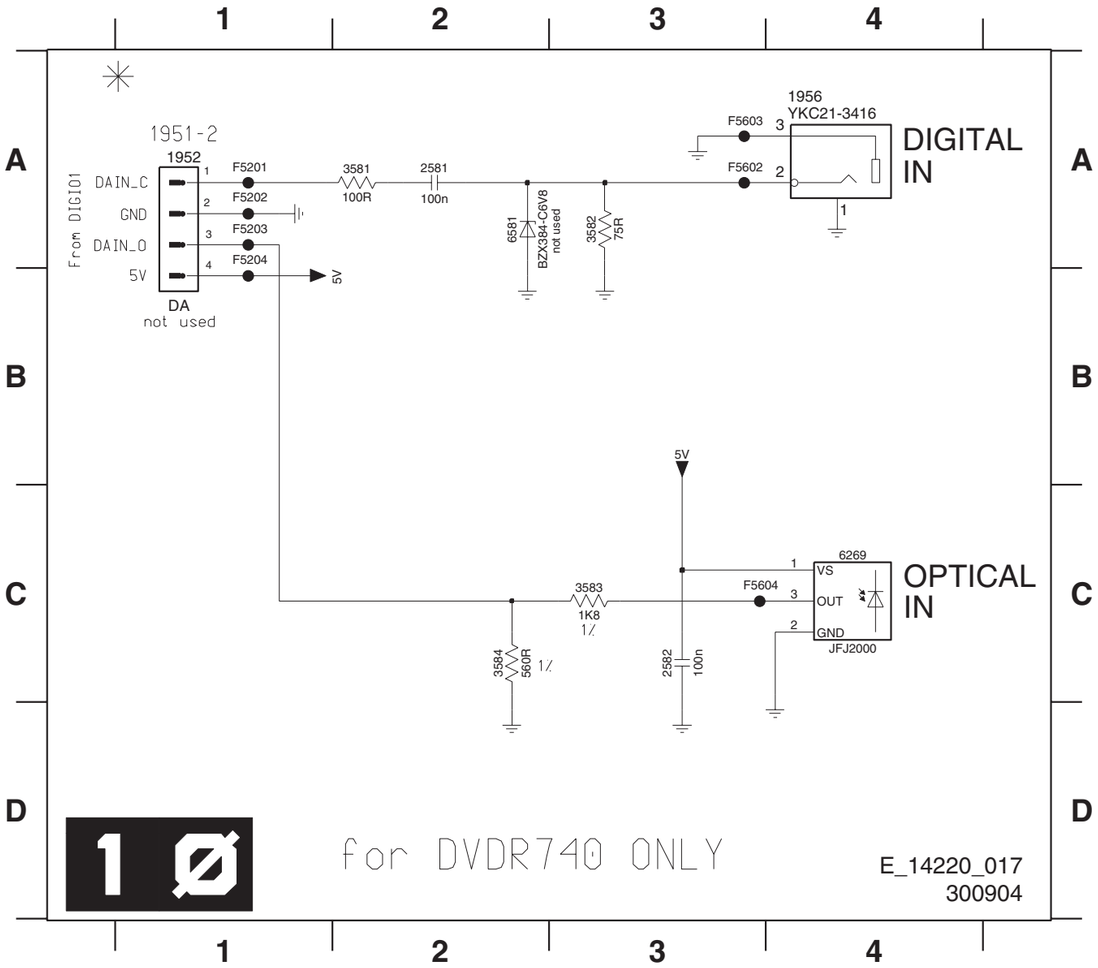
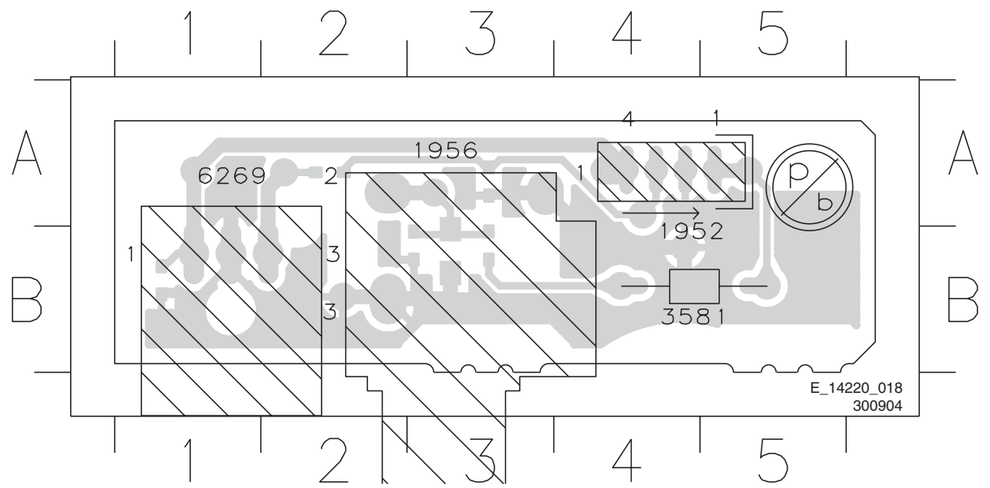
http://www.jdwxzlw.com/?fromuser=华盛维修

MOBO : Digital In/Out 2 (DIGIO 2)

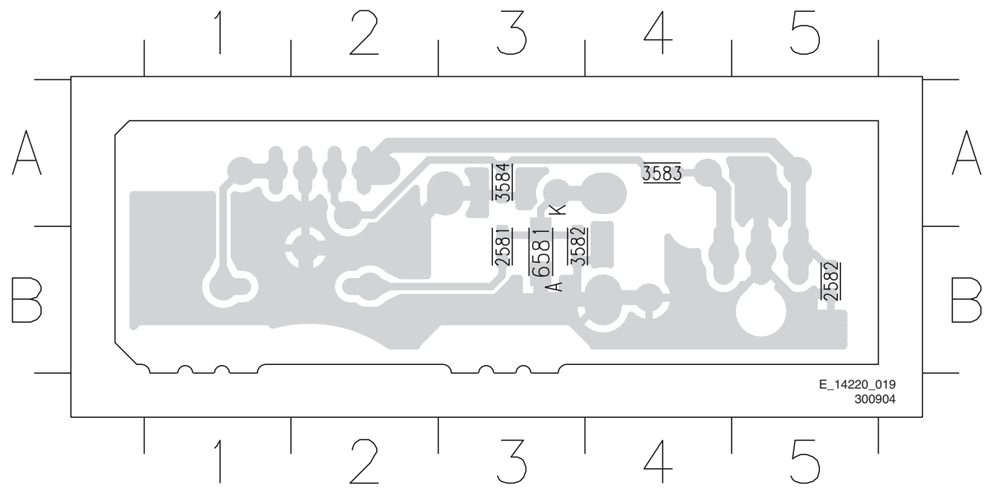
1952 A1 2581 A2 3581 A2 3583 C3 6269 C4 F5201 A1 F5203 A1 F5602 A3 F5604 C3
1956 A4 2582 C3 3582 A3 3584 C2 6581 A2 F5202 A1 F5204 A1 F5603 A3



Layout: MOBO - Digital In/Out 2 Part



1952 B4
1956 A3
3581 B4
6269 A1



2581 B3
2582 B5
3582 B3
3583 A4
3584 A3
6581 B3

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Front: Keyboard (KEY)

1 1

CINCH 1920
CVBS
AL
AR
JPJ1127
F2001
F2004
F2005
F2006
5ESD
BZX384-C12
6200
6201
6202
3201 75R
3202 470R
3204 75R
3206 470R
2202 470p
2204 470p
GND

S-CONN 1921
C
Y
YKF51
F2202
F2203
F2204
3207 75R
3208 75R
2205 100n
I228

RECORD
For DVDR740 only
*6209
*6210
I222
I223
LTL-1MHHR
6211
I204
3209 270R
I205
3210 270R
3228 330R
4200
For DVDR615 only

3200 10K
5VSTBY
2208 100n *
2200 10n
2201 10u 25V
2209 100n *

7200 TSOP4836ZC1
3203 220R
1K0 3205
I200
I201
VS
OUT
GND
2203 22u

1922
15FMN-BTRK-A
F2101
F2102
F2105
F2106
F2107
F2108
F2109
F2110
F2111
F2112
F2113
F2114
F2115
1 YFIN
2 GND
3 CFIN
4 GND
5 CVBSFIN
6 KEY1
7 AFCLI
8 5VSTBY
9 AFCRI
10 KEY2
11 RC
12 TEMP
13 LED_EPG
14 LED_TRAY
15 REC
to IOV

3211 -1-
2322640

1923
Tray_Led 1
GND 3
KEY1 F2303
F2301
F2304
With Dipmate 0003
to STBY BOARD

1924
GND2
KEY1
With Dipmate 0004
to OPCL BOARD

3214 10K
3215 2K2
3216 2K2
3219 10K
3220 220R
I211
I212
1202
1203
EVQ11L05R
PREV
NEXT
2207 10n
3227 10K
3223 47K
3224 220R
3225 10K
3226 220R
I210
I227
I205
I215
I207
I216
I208
I217
I209
I218
STOP
REC
PLAY
STOP
PLAY
For DVDR615 only
For DVDR740 only
For DVDR615 only
2206 10n

* OPTION

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011004

1202 F3
1203 F3
1205 F6
1207 F6
1208 F7
1209 F7
1210 F5
1920 A1
1921 C1
1922 C9
1923 E1
1924 F1
2200 A8
2201 A8
2202 B3
2203 B9
2204 B3
2205 D2
2206 F8
2207 F4
2208 A7
2209 A8
3200 A8
3201 A3
3202 A3
3203 B9
3204 B2
3205 B8
3206 B3
3207 D2
3208 D3
3209 D6
3210 D7
3211 D8
3214 E2
3215 E4
3216 E9
3219 F3
3220 F3
3223 F6
3224 F6
3225 F7
3226 F8
3227 F5
3228 D4
4200 E4
6200 A2
6201 A2
6202 A2
6203 C2
6204 C3
6209 D4
6210 D4
6211 D5
7200 B9
F2001 B1
F2004 A2
F2005 A2
F2006 A2
F2101 C9
F2102 C9
F2105 C9
F2106 C9
F2107 C9
F2108 D9
F2109 D9
F2110 D9
F2111 D9
F2112 D9
F2113 D9
F2114 D9
F2115 D9
F2202 C1
F2203 C1
F2204 C1
F2301 E1
F2303 E1
F2304 E1

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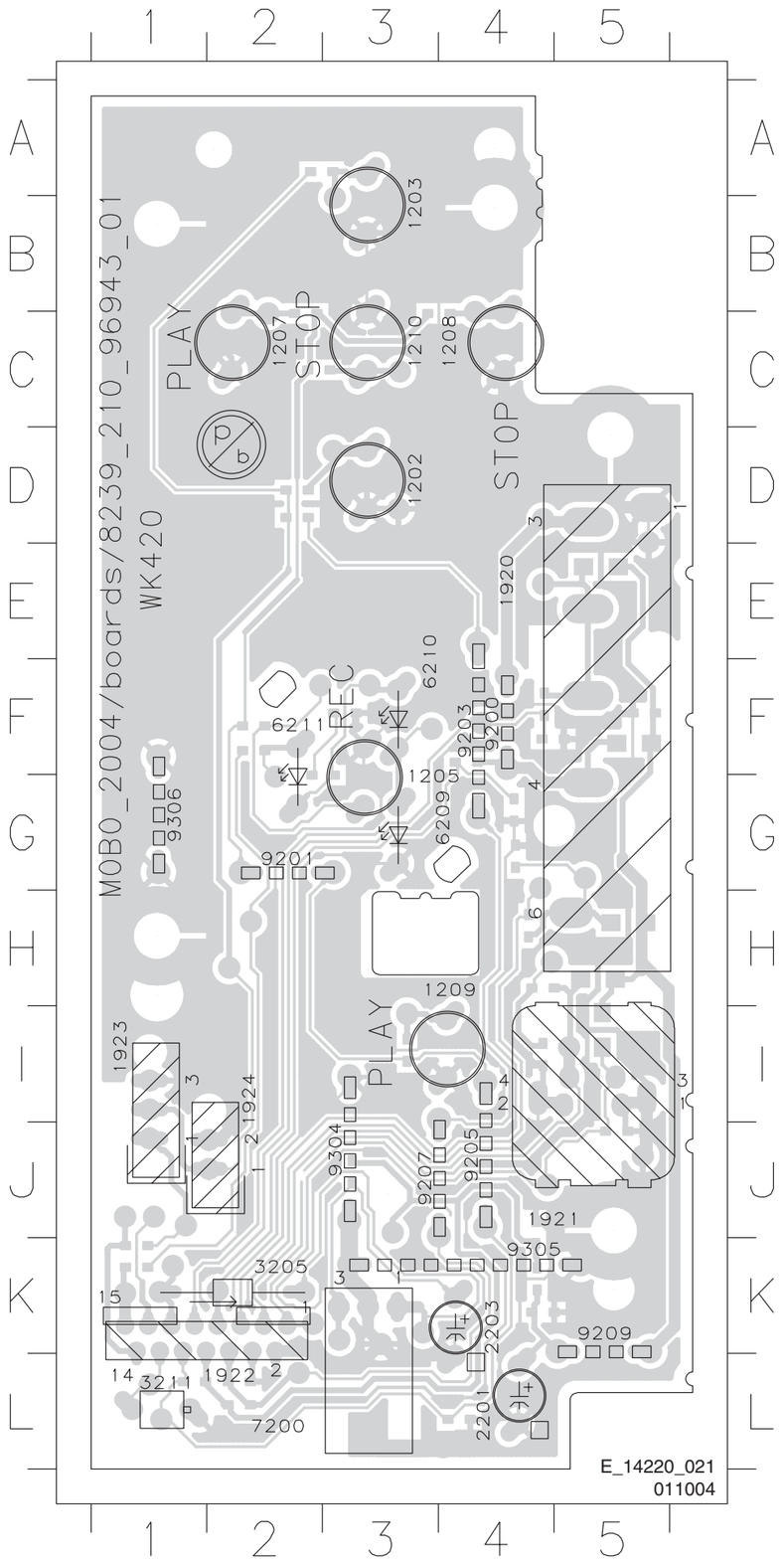
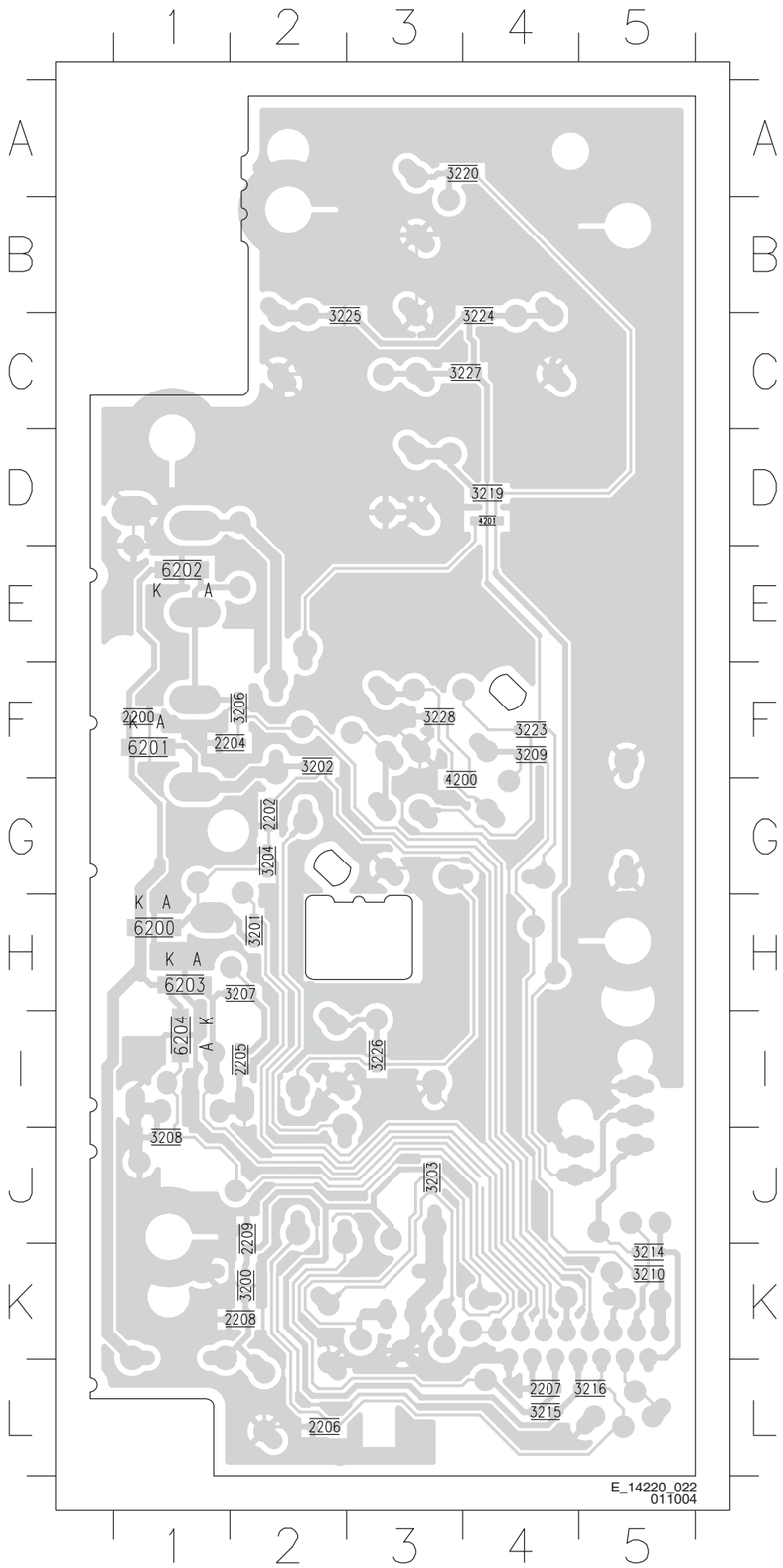
Layout Front - Keyboard part



1202 D3
1203 B3
1205 G3
1207 C2
1208 C4
1209 H4
1210 C3
1920 E4
1921 J4
1922 L2
1923 I1
1924 I2
2201 L4
2203 K4
3205 K2
3211 L1
6209 G4
6210 F3
6211 F2
7200 L2
9200 F4
9201 G2
9203 F4



2200 F1
2202 G2
2204 F1
2205 I2
2206 L2
2207 L4
2208 K2
2209 J2
3200 K2
3201 H2
3202 F2
3203 J3
3204 G2
3206 F2
3207 H2
3208 J1
3209 F4
3210 K5
3214 K5
3215 L4
3216 L5
3219 D4
3220 A3

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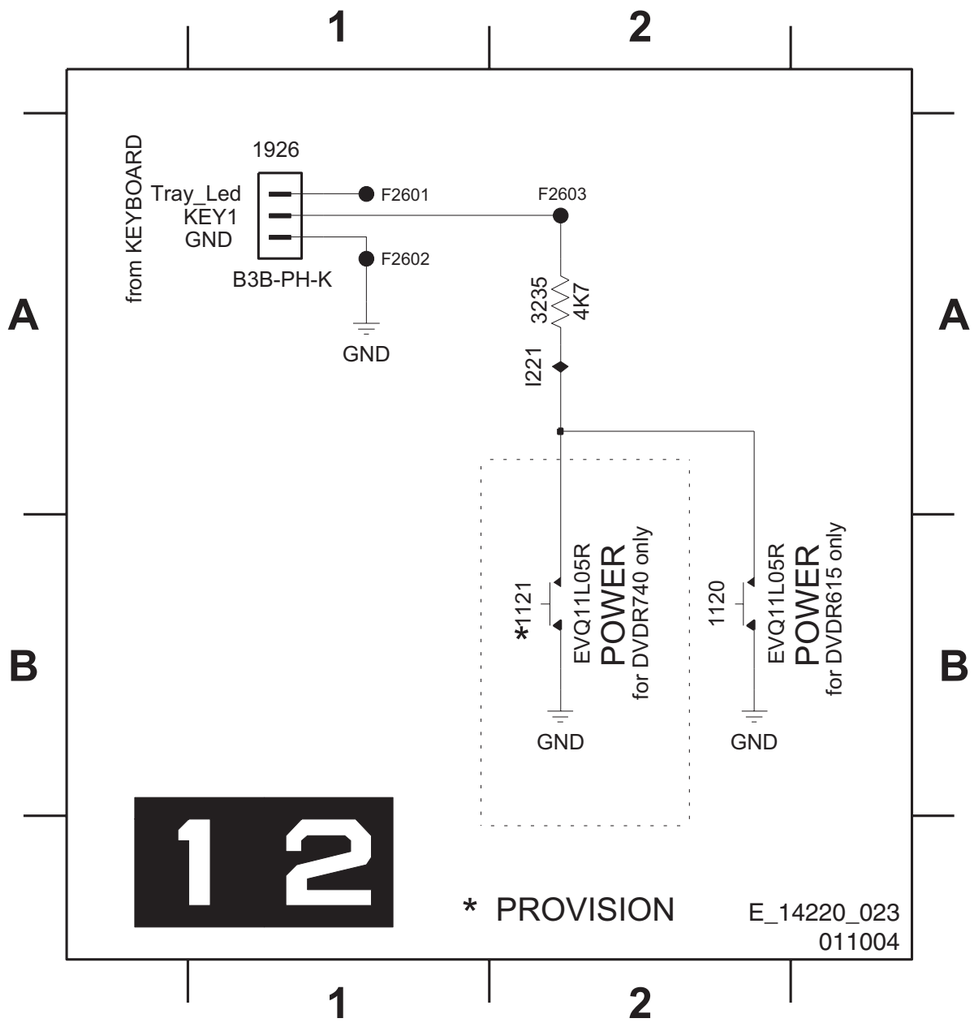
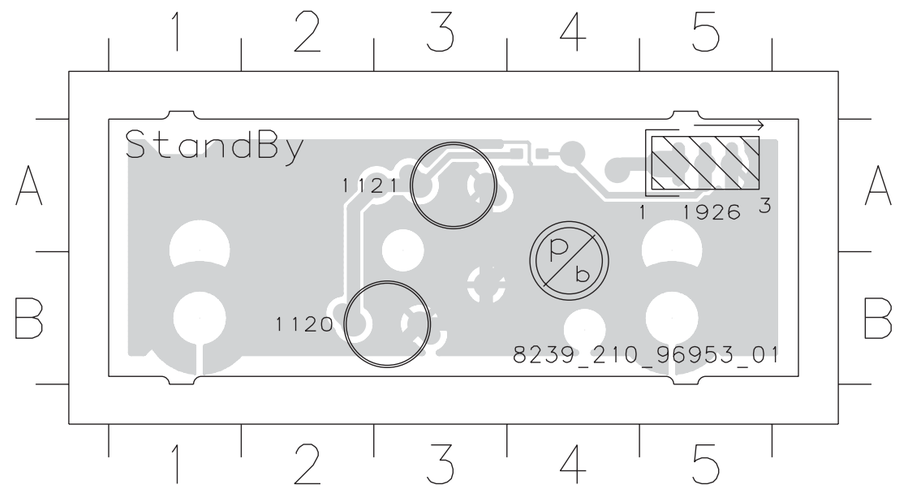
Front: Stand-by(STBY)

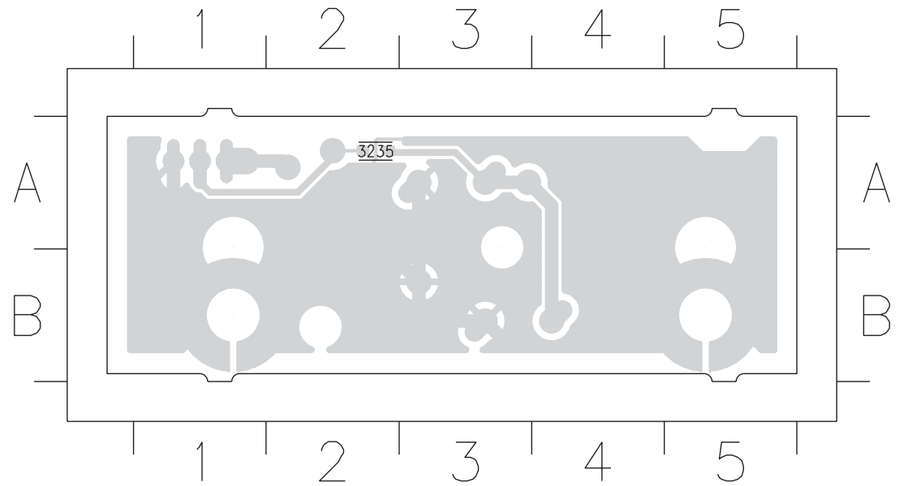
1120 B2	1926 A1	F2601 A1	F2603 A2
1121 B2	3235 A2	F2602 A1	I221 A2



Layout: Front - Standby Part



1120 B2
1121 A2
1926 A5



3235 A2

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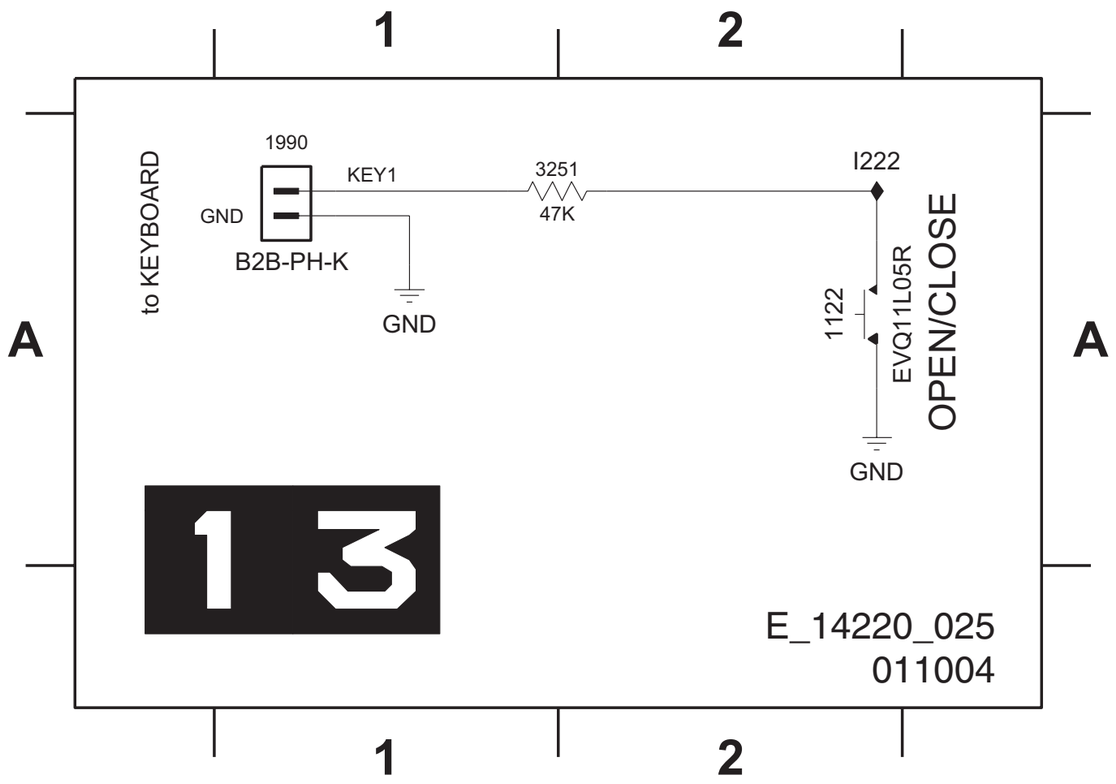
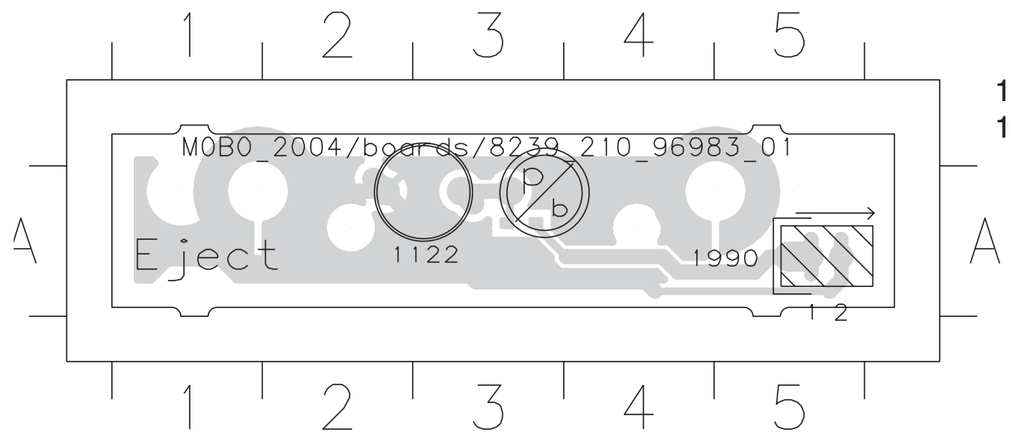
Front: Open/Close (OPCL)

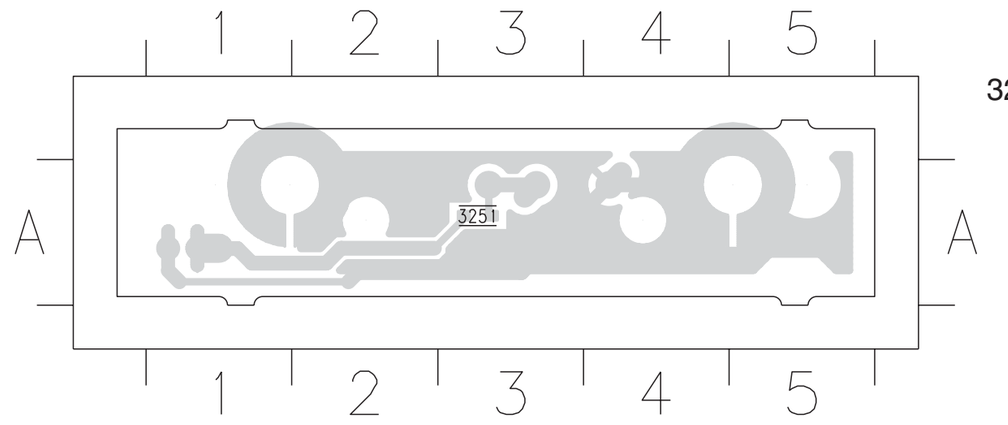
1122 A2 1990 A1 3251 A1 I222 A2



Layout: Front - Open/Close part



1122 A3
1990 A5



3251 A3

E_14220_026
011004

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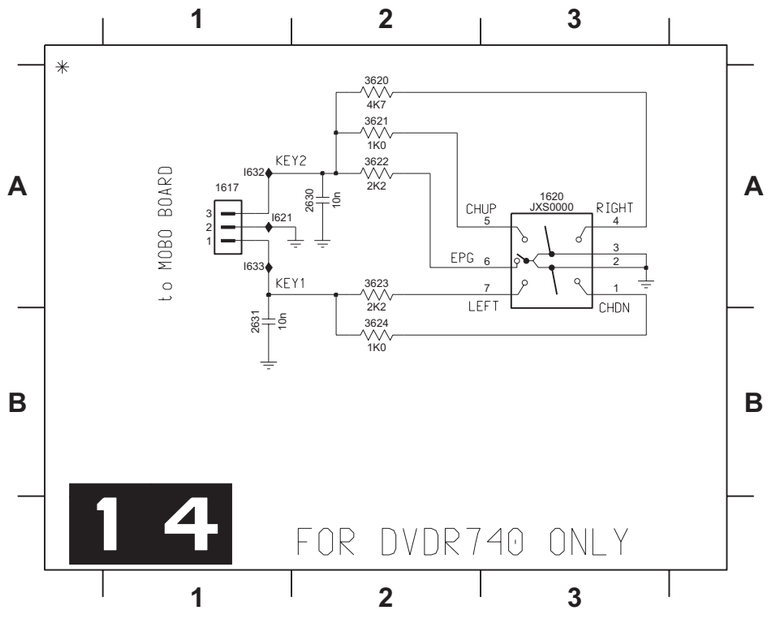
Front: 5-Way Switch (5WSW)

1617 A1 2630 A2 3620 A2 3622 A2 3624 B2 I632 A1
1620 A3 2631 B1 3621 A2 3623 A2 I621 A1 I633 A1



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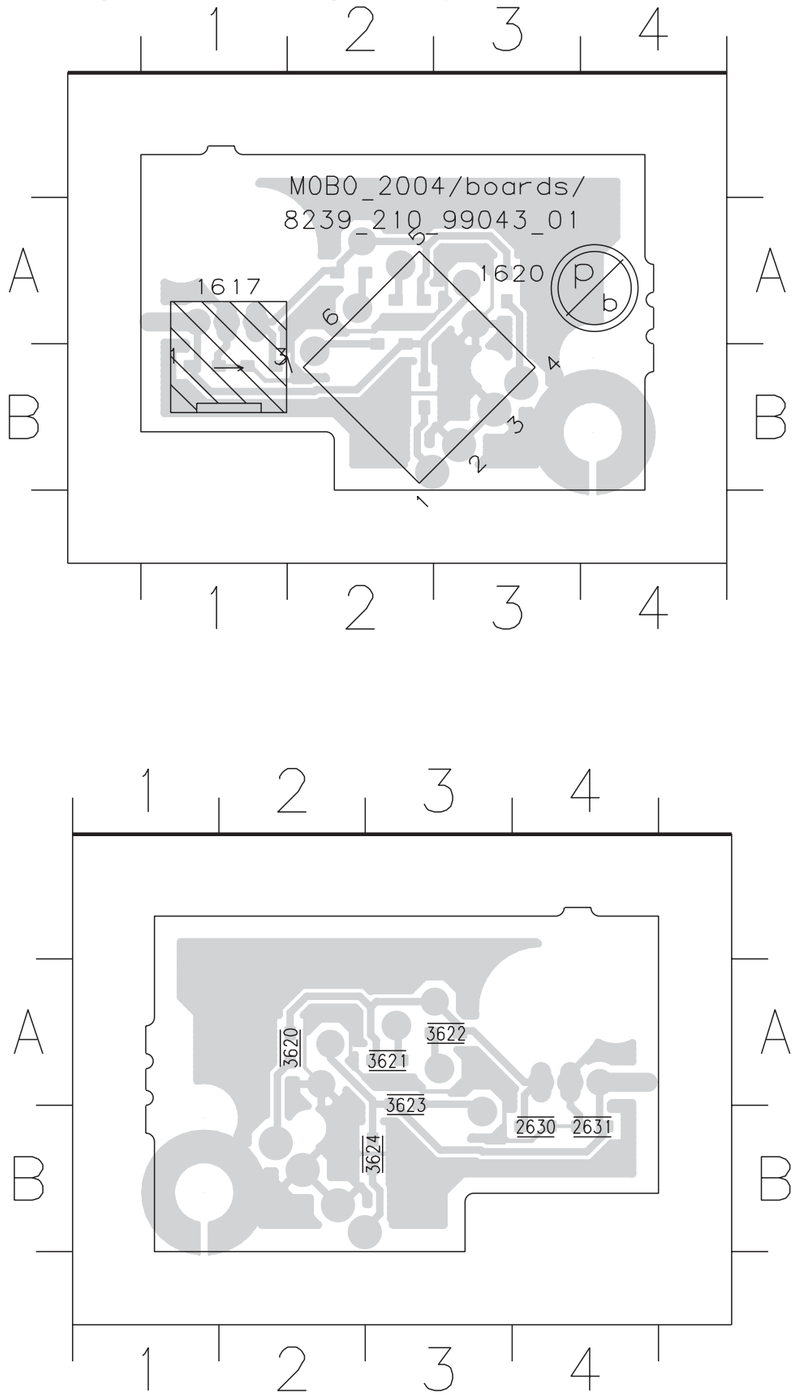
Layout : Front - 5-Way Switch part



1617 A1
1620 A3

2630 B4
2631 B4
3620 A2
3621 A3
3622 A3
3623 A3
3624 B3

E_14220_028
011004

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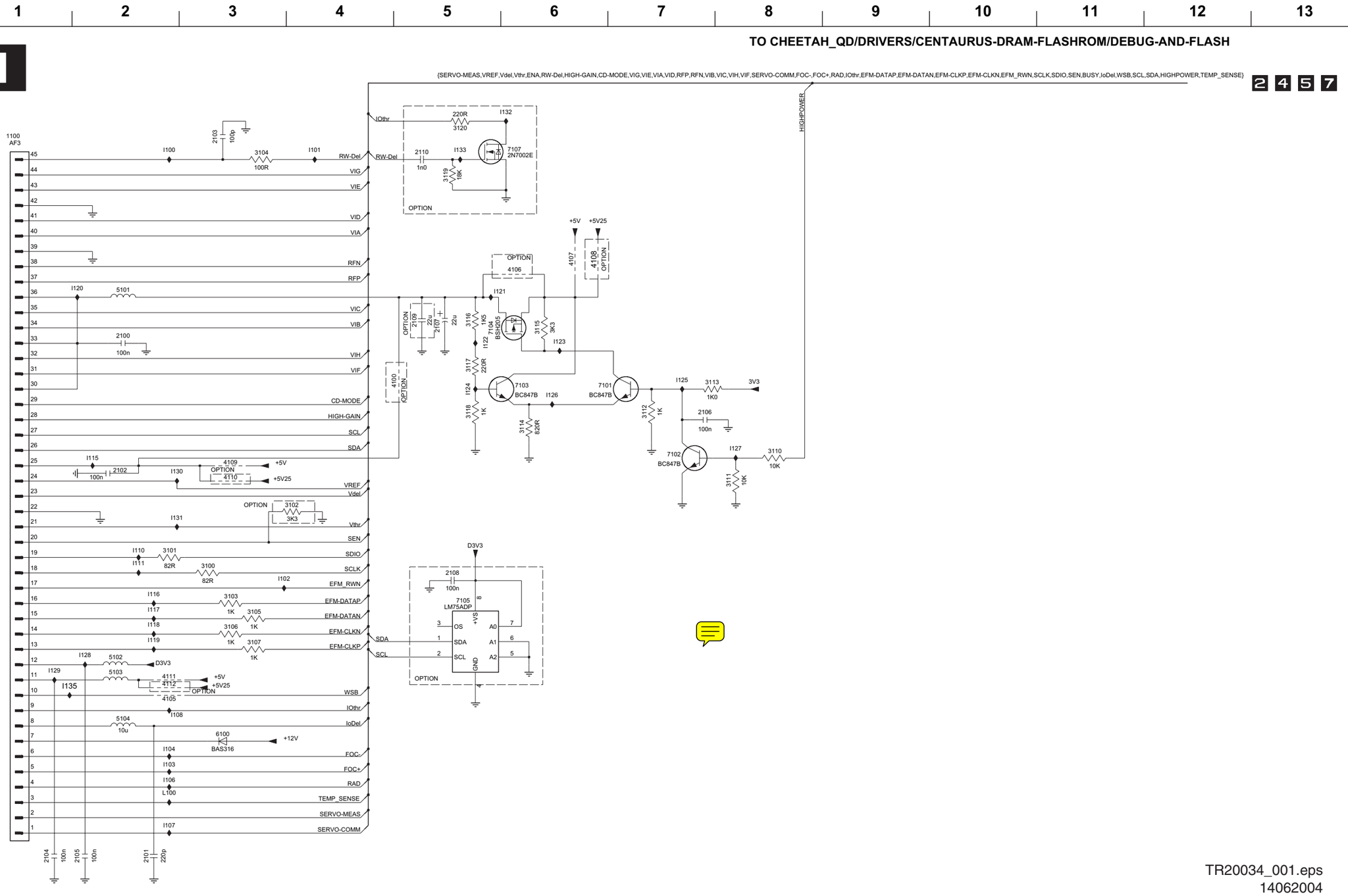
FEBE: FE OPU Interface

TO CHEETAH_QD/DRIVERS/CENTAURUS-DRAM-FLASHROM/DEBUG-AND-FLASH

{SERVO-MEAS,VREF,Vdel,Vthr,ENA,RW-Del,HIGH-GAIN,CD-MODE,VIG,VIE,VIA,VID,RFP,RFN,VIB,VIC,VIH,VIF,SERVO-COMM,FOC-,FOC+,RAD,IOthr,EFM-DATAP,EFM-DATAN,EFM-CLKP,EFM-CLKN,EFM_RWN,SCLK,SDIO,SEN,BUSY,IoDel,WSB,SCL,SDA,HIGHPOWER,TEMP_SENSE}

2 4 5 7



TR20034_001.eps
14062004

1100 A1
2100 C2
2101 H2
2102 E2
2103 A3
2104 H1
2105 H2
2106 D7
2107 C5
2108 E5
2109 C5
2110 B5
3100 E3
3101 E2
3102 E4
3103 F3
3104 B3
3105 F3
3106 F3
3107 F3
3110 D8
3111 E8
3112 D7
3113 D7
3114 D6
3115 C6
3116 C5
3117 D5
3118 D5
3119 B5
3120 A5
4100 D5
4105 G2
4106 C6
4107 C6
4108 C6
4109 D3
4110 E3
4111 F2
4112 F2
5101 C2
5102 F2
5103 F2
5104 G2
6100 G3
7101 D7
7102 D7
7103 D6
7104 C5
7105 F5
7107 B6
I100 A2
I101 A4
I102 E3
I103 G2
I104 G2
I106 G2
I107 H2
I108 G2
I110 E2
I111 E2
I115 D2
I116 F2
I117 F2
I118 F2
I119 F2
I120 C2
I121 C5
I122 C5
I123 C6
I124 D5
I125 D7
I126 D6
I127 D8
I128 F2
I129 F1
I130 D2
I131 E2
I132 A6
I133 A5
I135 F1
L100 G2

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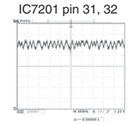
FEBE: FE Cheetah 2 Pre-processing

{TIMOUT,RFP,RFN,VIA,VIB,VIC,VID,VIE,VIF,VIG,VIH,EFM-CLKP,EFM-CLKN,EFM-DATAP,EFM-DATAN,LASP,PPNO,RFP3,RFN3,RFREF,CALF,A1,A2,S2-XDN,D1_TILTN,D2_TLN,D3_REN,D4_FEN,S1_MIRN,MON1,MON2,SIDA,SICL,SILD,SDA,SCL,ALFA,FTC,RW-Del,EFM_RWN,RFP5,RFN5}

1 3 5

TO OPU/EPLD-LADIC-CON/LACONIC_IC/CENTAURUS

I257 / I259 RFN3 / RFP3, IC7201 pin 31, 32



TZA1047

CHEETAH2

TR20035_001.eps
14062004

2204 B4
2205 B4
2209 B2
2210 B2
2211 B2
2212 B3
2213 E7
2214 E7
2215 E7
2217 E6
2218 E7
2219 B3
2221 C3
2223 F6
2228 D6
2229 G8
2230 G9
2231 H9
2232 I8
2233 I9
2234 I9
3200 B4
3201 B4
3202 B4
3204 C4
3206 E7
3207 G4
3208 G5
3209 G2
3210 H2
3211 H2
3212 H2
3213 F7
3215 C2
3216 C2
3217 F7
3218 G7
3219 I7
3220 G8
3221 G8
3222 G8
3223 H8
3224 G9
3225 I8
3226 H8
3227 I8
3228 I8
3229 I9
4200 H11
4201 H11
4202 C5
4203 C4
4204 C4
5202 B1
7201 C3
7202 G8
7203 I8
I201 B2
I202 C5
I203 C5
I204 C5
I205 C5
I206 C5
I207 C5
I208 C4
I209 C4
I212 C3
I214 C4
I215 D3
I216 C6
I217 D6
I218 D3
I219 D6
I220 D3
I221 D6
I222 D6
I223 C4
I224 D3
I225 C4
I226 E3
I227 E3
I228 E6
I229 E3
I231 E3
I232 F5
I233 E3
I234 E6
I235 F4
I237 E6
I238 F6
I239 E6
I240 G3
I241 F6
I242 B4
I243 B4
I244 F3
I247 F6
I248 F3
I249 F3
I250 H5
I251 H5
I252 H4
I253 F4
I254 G1
I257 G6
I258 G6
I259 I6
I260 I6
I261 H1
I262 H1
I263 H1
I264 E7

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FEBE: FE Laconic Pre-processing

3

TO OPU/EPLD/CENTAURUS

{WSB,RW-Del,OSC_IN,PORN,SCL,SDA,SCLK,SDIO,SEN,HIGH-GAIN,CD-MODE,ALFA,LASP,Vdel,Vthr,VREF,IOthr,CD-MODE,HIGH-GAIN,IRQN,OSTR,SDA,SCL,IoDel}

1 5

OSC_IN I307 2311 1n0 3303 150R I320

2312 15p

2303 15p 2304 15p 1302 CX-16F 16M93 3300 1M OPTION I308 I310 3315 33R

ALFA I311

Vdel L305

Vthr OPTION 2310 100n 3308 10K 3V3A 4303 I314

VREF 3309 1K8 I319

I301 SEN

I312 SDIO

I300 SCLK

SDA

SCL

IRQN 3316 3V3D 10K I306

I305 OSTR

PORN 1R 3302 OPTION 2308 100n Temp Val I304

RW-Del

L307

3V3D 3V3A

7300 TZA1042

29 40 2 VDDD

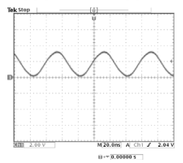
9 18 VDDA

1	AEZ
4	CLKOUT
5	OSCO
6	OSCI
8	AMES
14	VDEL
15	VTHR
17	VREFIN
30	BUSY
31	SEN
32	SDIO
33	SCLK
43	SDA
44	SCL
35	IRQ_
36	OSTR
37	RESET_
38	RW_
41	BANK

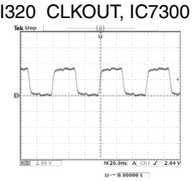
28 39 3 10 19 VSSD VSSA

11	LASP	U1 LASP
12	VREFL	I316
13	VREFH	I317 2305 22n
16	VOPUREF	VREF
21	IAPCW	L310 IoDel
22	IACPR	IOthr
25	ENR1	
24	ENR2	
26	DVDCD	I315 CD-MODE
27	HILO	I302 HIGH-GAIN
34	WSB	L311 WSB
20	TEST1A	L306
23	TEST2A	L304
7	TEST1D	L303
42	TEST2D	L301

I308 XTAL 1302



I320 CLKOUT, IC7300 pin 4



I318 L309 OPTION 2309 100n 3V3D 3301 10K

3304 10K 3305 10K 3306 10K OPTION 3V3D

A3V3 5301 I313 3V3A 2306 100n 2307 100n

D3V3 5300 I303 3V3D 2301 100n 2302 100n 2300 100n

TR20036_001.eps
14062004

U1 B5
1302 B2
2300 E4
2301 E4
2302 E4
2303 A2
2304 B2
2305 B5
2306 E2
2307 E2
2308 D3
2309 C7
2310 B2
2311 A2
2312 A2
3300 B2
3301 C7
3302 D2
3303 A2
3304 C6
3305 C6
3306 C6
3308 B2
3309 B2
3315 B3
3316 C2
4303 B3
5300 E3
5301 E1
7300 A4
I300 C3
I301 C3
I302 C5
I303 E4
I304 D3
I305 D3
I306 C3
I307 A2
I308 B3
I310 B3
I311 B3
I312 C3
I313 E1
I314 B3
I315 C5
I316 B5
I317 B5
I318 C6
I319 C3
I320 A3
L301 D5
L303 D5
L304 C5
L305 B3
L306 C5
L307 D3
L308 A3
L309 C6
L310 B5
L311 C5

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FEBE: FE Drivers

4

TO CENTAURUS/DEBUG-AND-FLASH

OPU /CENTAURUS/POWER-CONN-AUDIO/DEBUG CONN

{AUXPW,SERVO-COMM,SERVO-MEAS,TR+,TR-,FO+,FO-,SL,RA,DRIVER-ON,FOC-,FOC+,RAD,TRAY-SW,TRAY-INOUT,VFOO-,VFOO+,VRAOO,SL-,SL+,STEP-SIN,STEP-COS,OUTSLD1+,-OUTSLD1-,-OUTSLD2+,-OUTSLD2-,TOSTOCEN,TRAYSW,MOTOR-ON,T1,VMOTO1O,MOTO1,RAD_MUTE,ACT_EMF,TEMP_WARNING}

1 2 3 5 7

CONN 1400-1, 2, 3, 4

CONN 1401-4, 5, 6, 8, 9, 10

CONN 1401-1, 2, 3

TR20037_002.eps
30062004

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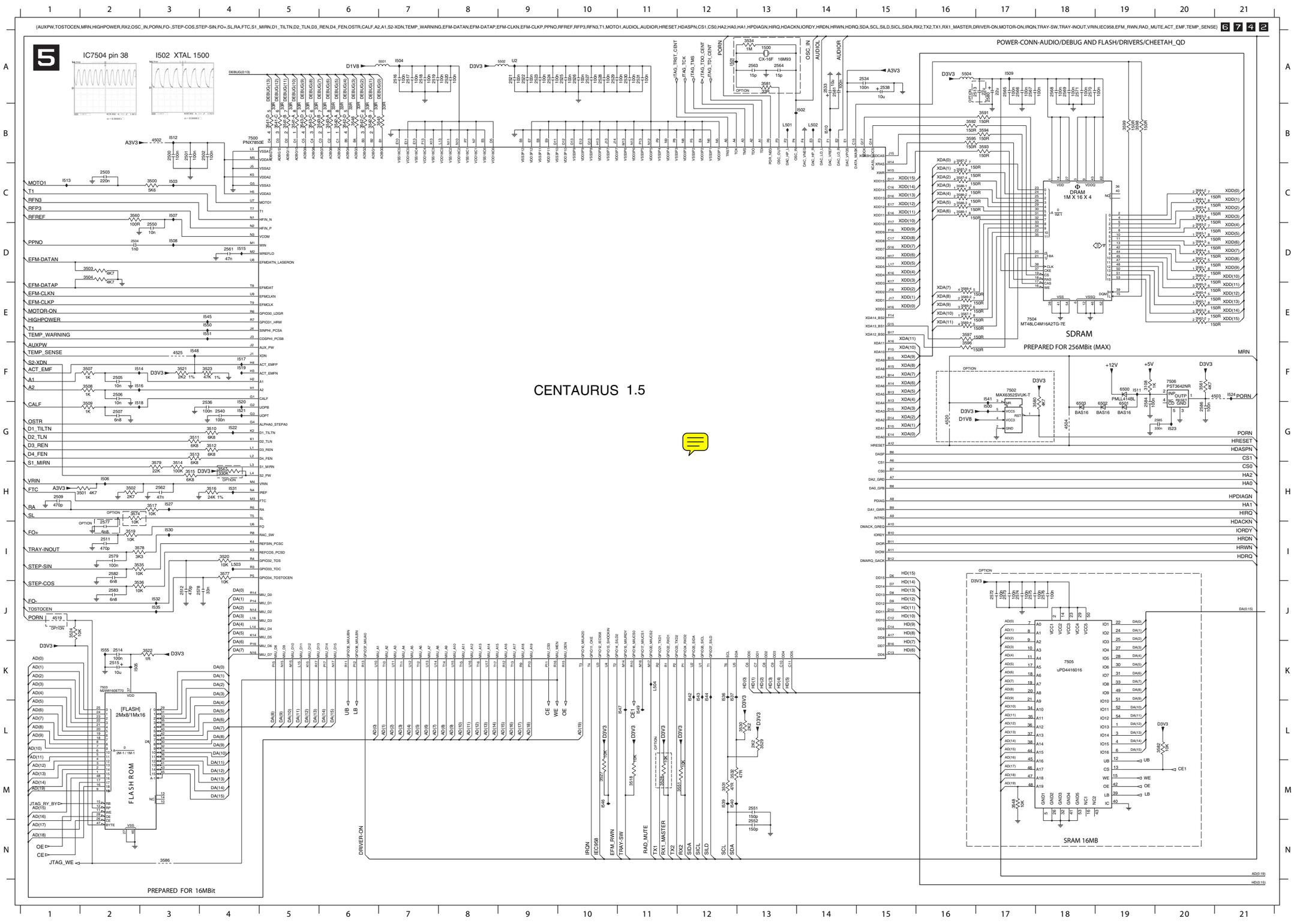
FEBE: FE Centaurus 1.5 Processor



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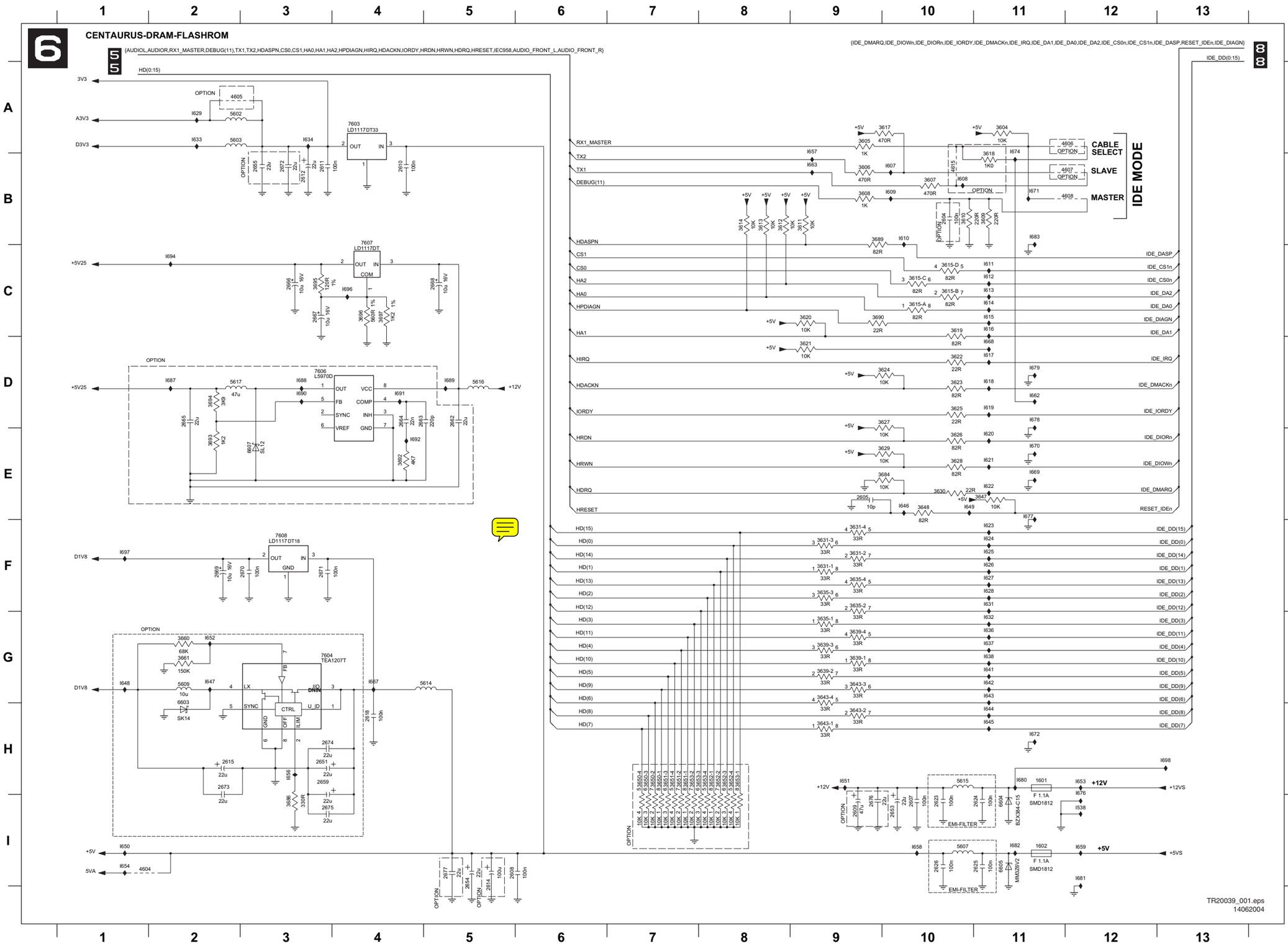
http://www.jdwxzlw.com/?fromuser=华盛维修

FEBE: FE Supply / BE Interface



1601 H11	4608 B12	2604 B10	5602 A2	3614 B10	3650-1 H7	3688 B9	3631 F11
1602 I11	4615 B10	2605 E9	5603 A2	3615-A C10	3650-2 H7	3689 B11	3632 G11
2604 B10	5602 A2	2607 I10	5607 I10	3615-B C10	3650-3 H7	3690 C9	3633 A2
2605 E9	5603 A2	2608 I5	5609 G2	3615-C C10	3650-4 H7	3692 E4	3634 A3
2607 I10	5607 I10	2609 I9	5614 G5	3615-D C10	3651-1 H7	3693 E2	3636 G11
2608 I5	5609 G2	2610 B4	5615 H10	3617 A10	3651-2 H7	3694 D2	3637 G11
2609 I9	5614 G5	2611 B3	5616 D5	3618 B11	3651-3 H7	3695 C3	3641 H11
2610 B4	5615 H10	2612 B3	5617 D2	3619 C10	3651-4 H7	3696 C4	3645 H11
2611 B3	5616 D5	2614 I5	6603 H2	3620 C9	3652-1 H8	3697 C4	3646 E10
2612 B3	5617 D2	2615 H2	6604 I11	3621 D9	3652-2 H8	4604 I1	3647 E11
2614 I5	6603 H2	2618 H4	6605 I11	3622 D10	3652-3 H8	4605 A2	3648 E10
2615 H2	6604 I11	2623 I10	6607 E3	3623 D10	3652-4 H8	4606 A12	3650-1 H7
2618 H4	6605 I11	2624 I11	7603 A4	3624 D10	3653-1 H8	4607 B12	3650-2 H7
2623 I10	6607 E3	2625 I11	7604 G3	3625 D10	3653-2 H7		3650-3 H7
2624 I11	7603 A4	2626 I10	7606 D3	3626 E10	3653-3 H8		3650-4 H7
2625 I11	7604 G3	2651 H3	7607 B4	3627 D10	3653-4 H8		3651-1 H7
2626 I10	7606 D3	2653 I5	7608 F3	3628 E10	3660 G2		3651-2 H7
2651 H3	7607 B4	2654 I5	I538 I12	3629 E10	3661 G2		3651-3 H7
2653 I5	7608 F3	2655 B3	I607 B10	3630 E10	3684 E10		3651-4 H7
2654 I5	I538 I12	2659 H3	I608 B10	3631-1 F9	3686 I3		3652-1 H8
2655 B3	I607 B10	2662 D5	I609 B10	3631-2 F9	3689 B9		3652-2 H8
2659 H3	I608 B10	2663 D4	I610 B10	3631-3 F9	3690 C9		3652-3 H8
2662 D5	I609 B10	2664 D4	I611 C11	3631-4 F9	3692 E4		3652-4 H8
2663 D4	I610 B10	2665 D2	I612 C11	3635-1 G9	3693 E2		3653-1 H8
2664 D4	I611 C11	2666 C3	I613 C11	3635-2 F9	3694 D2		3653-2 H7
2665 D2	I612 C11	2667 C3	I614 C11	3635-3 F9	3695 C3		3653-3 H8
2666 C3	I613 C11	2668 C5	I615 C11	3635-4 F9	3696 C4		3653-4 H8
2667 C3	I614 C11	2669 F2	I616 C11	3639-1 G9	3697 C4		3660 G2
2668 C5	I615 C11	2670 F3	I617 D11	3639-2 G9	4604 I1		3661 G2
2669 F2	I616 C11	2671 F3	I618 D11	3639-3 G9	4605 A2		3684 E10
2670 F3	I617 D11	2672 B3	I619 D11	3639-4 G9	4606 A12		3686 I3
2671 F3	I618 D11	2673 H2	I620 E11	3643-1 H9	4607 B12		3689 B9
2672 B3	I619 D11	2674 H3	I621 E11	3643-2 H9			3690 C9
2673 H2	I620 E11	2675 I3	I622 E11	3643-3 G9			3692 E4
2674 H3	I621 E11	2676 I9	I623 F11	3643-4 G9			3693 E2
2675 I3	I622 E11	2677 I5	I624 F11	3647 E11			3694 D2
2676 I9	I623 F11	3604 A11	I625 F11	3648 E10			3695 C3
2677 I5	I624 F11	3605 A9	I626 F11	3650-1 H7			3696 C4
3604 A11	I625 F11	3606 B9	I627 F11	3650-2 H7			3697 C4
3605 A9	I626 F11	3607 B10	I628 F11	3650-3 H7			4604 I1
3606 B9	I627 F11	3608 B9	I629 A2	3650-4 H7			4605 A2
3607 B10	I628 F11	3609 B11	I631 F11	3651-1 H7			4606 A12
3608 B9	I629 A2	3610 B10	I632 G11	3651-2 H7			4607 B12
3609 B11	I631 F11	3611 B9	I633 A2	3651-3 H7			
3610 B10	I632 G11	3612 B8	I634 A3	3651-4 H7			
3611 B9	I633 A2	3613 B8	I636 G11	3652-1 H8			
3612 B8	I634 A3	3614 B8	I637 G11	3652-2 H8			
3613 B8	I636 G11	3615-A C10	I638 G11	3652-3 H8			
3614 B8	I637 G11	3615-B C10	I641 G11	3652-4 H8			
3615-A C10	I638 G11	3615-C C10	I642 G11	3653-1 H8			
3615-B C10	I641 G11	3615-D C10	I643 G11	3653-2 H7			
3615-C C10	I642 G11	3617 A10	I644 H11	3653-3 H8			
3615-D C10	I643 G11	3618 B11	I645 H11	3653-4 H8			
3617 A10	I644 H11	3619 C10	I646 E10	3660 G2			
3618 B11	I645 H11	3620 C9	I647 G2	3661 G2			
3619 C10	I646 E10	3621 D9	I648 G1	3684 E10			
3620 C9	I647 G2	3622 D10	I649 E10	3686 I3			
3621 D9	I648 G1	3623 D10	I650 I1	3689 B9			
3622 D10	I649 E10	3624 D10	I651 H9	3690 C9			
3623 D10	I650 I1	3625 D10	I652 G2	3692 E4			
3624 D10	I651 H9	3626 E10	I653 H12	3693 E2			
3625 D10	I652 G2	3627 D10	I654 I1	3694 D2			
3626 E10	I653 H12	3628 E10	I656 H3	3695 C3			
3627 D10	I654 I1	3629 E10	I657 A9	3696 C4			
3628 E10	I656 H3	3630 E10	I658 I10	3697 C4			
3629 E10	I657 A9	3631-1 F9	I659 I12	4604 I1			
3630 E10	I658 I10	3631-2 F9	I662 D11	4605 A2			
3631-1 F9	I659 I12	3631-3 F9	I663 B9	4606 A12			
3631-2 F9	I662 D11	3631-4 F9	I667 G4	4607 B12			
3631-3 F9	I663 B9	3635-1 G9	I668 D11				
3631-4 F9	I667 G4	3635-2 F9	I669 E11				
3635-1 G9	I668 D11	3635-3 F9	I670 E11				
3635-2 F9	I669 E11	3635-4 F9	I671 B11				
3635-3 F9	I670 E11	3639-1 G9	I672 H11				
3635-4 F9	I671 B11	3639-2 G9	I674 A11				
3639-1 G9	I672 H11	3639-3 G9	I676 H12				
3639-2 G9	I674 A11	3639-4 G9	I677 E11				
3639-3 G9	I676 H12	3643-1 H9	I678 D11				
3639-4 G9	I677 E11	3643-2 H9	I679 D11				
3643-1 H9	I678 D11	3643-3 G9	I680 H11				
3643-2 H9	I679 D11	3643-4 G9	I681 I12				
3643-3 G9	I680 H11	3647 E11	I682 I11				
3643-4 G9	I681 I12	3648 E10	I683 B11				
3647 E11	I682 I11	3650-1 H7	I687 D2				
3648 E10	I683 B11	3650-2 H7	I688 D3				
3650-1 H7	I687 D2	3650-3 H7	I689 D5				
3650-2 H7	I688 D3	3650-4 H7	I690 D3				
3650-3 H7	I689 D5	3651-1 H7	I691 D4				
3650-4 H7	I690 D3	3651-2 H7	I692 E4				
3651-1 H7	I691 D4	3651-3 H7	I694 C2				
3651-2 H7	I692 E4	3651-4 H7	I696 C4				
3651-3 H7	I694 C2	3652-1 H8	I697 F1				
3651-4 H7	I696 C4	3652-2 H8	I698 H13				
3652-1 H8	I697 F1	3652-3 H8					
3652-2 H8	I698 H13	3652-4 H8					
3652-3 H8		3653-1 H8					
3652-4 H8		3653-2 H7					
3653-1 H8		3653-3 H8					
3653-2 H7		3653-4 H8					
3653-3 H8		3660 G2					
3653-4 H8		3661 G2					
3660 G2		3684 E10					
3661 G2		3686 I3					
3684 E10		3689 B9					
3686 I3		3690 C9					
3689 B9		3692 E4					
3690 C9		3693 E2					
3692 E4		3694 D2					
3693 E2		3695 C3					
3694 D2		3696 C4					
3695 C3		3697 C4					
3696 C4		4604 I1					
3697 C4		4605 A2					
4604 I1		4606 A12					
4605 A2		4607 B12					
4606 A12							
4607 B12							

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FEBE: FE Tray Motor / Switch Connection & Debug Connectors

7

OPU/CHEETAH_QD/DRIVERS/CENTAURUS/POWER-CONN

{RAD,SERVO-COMM,MOTO1,MRN,RX1_MASTER,TX1,A1,A2,CALF,VRIN,D1_TILTN,D2_TLN,D3_REN,D4_FEN,S1_MIRN,S2,FTC,MON1,MON2,RX2,TX2,PPNO,IRQN,PORN,T1,SCL,SDA,S2-XDN,DRIVER-ON,FO-,FO+,VFOO-,VFOO+,RA,VRAOO,SL+,SL-,FOC+,FOC-,AUDIO_FRONT_L,AUDIO_FRONT_R,TR+,TR-,TRAYSW,EJECTKEY,SL,VSLOO,VMOTO1O}

1 2 4 5 6

DEBUG(0:13)

1700 — OPTION

1	1 4701-1 8	CALF	
2	2 4701-2 7	A2	
3	3 4701-3 6	A1	
4			
5	4 4701-4 5	S2-XDN	
6	3 4702-3 6	VRIN	
7	2 4702-2 7	D1_TILTN	
8	1 4702-1 8	D2_TLN	
9	4 4703-4 5	D3_REN	
10	3 4703-3 6	D4_FEN	
11			
12	2 4703-2 7	S1_MIRN	
13	1 4703-1 8	S2	
14	4 4702-4 5	FTC	
15			
16	1 4705-1 8	MON1	
17	4 4706-4 5	MON2	
18	3 4704-3 6	PPNO	
19			
20	4 4704-4 5	TX1	
21	1 4704-1 8	TX2	
22			
23	4 4705-4 5 I721	RX1_MASTER	
24	2 4704-2 7 I722	RX2	
25			
26	2 4705-2 7	IRQN	
27	1 4706-1 8	PORN	
28	3 4705-3 6 I723	MRN	
29	2 4706-2 7	T1	
30	4707	SCL	
31	3 4706-3 6	SDA	
32			
33		DEBUG(4)	
34		DEBUG(0)	
35		DEBUG(1)	
36		DEBUG(2)	
37		DEBUG(3)	
38			
39	L700	DEBUG(5)	
40	L701	DEBUG(6)	
41	L702	DEBUG(7)	
42			
43	I715	DEBUG(10)	DEBUG(10)
44	L703	DEBUG(8)	DEBUG(8)
45	I716	DEBUG(12)	DEBUG(12)
46	I717	DEBUG(13)	DEBUG(13)
47			
48	I718	DEBUG(9)	DEBUG(9)
49	I719	DEBUG(11)	DEBUG(11)
50			

OPTION D3V3: 3709 10K, 3708 10K, 3711 10K, 3710 10K, 3712 10K

DEBUG(4) I700 DEBUG(0) I701 DEBUG(1) I702 DEBUG(2) I703 DEBUG(3) I704 I705 DEBUG(6) I707 DEBUG(7) I709 DEBUG(8) I711 DEBUG(5) I713

1703 DV — OPTION

I700	1	2	
I701	3	4	
I702	5	6	
I703	7	8	
I704	9	10	
I705	11	12	
I707	13	14	
I709	15	16	
I711	17	18	
I713	19	20	

Solder Pads

1702

1	TRAYSW
2	
3	TR-
4	TR+

D3V3: 3702 10K, 3703 10K, 3704 10K, 3705 10K, 3706 10K, 3707 10K — OPTION

1705 — OPTION

1	FO-
2	VFOO-
3	FO+
4	VFOO+
5	RA
6	VRAOO
7	SL
8 I724	
9	MOTO1
10	VMOTO1O
11	
12	SL+
13	SL-
14	FOC+
15	FOC-
16	RAD
17	SERVO-COMM
18	DRIVER-ON
19	
20	
22	21

D3V3: 3713 10K, 3714 10K, 3715 10K, 3716 10K — OPTION

JTAG CONECTION

JTAG_TRST_CENT	I720	I706
JTAG_TDO_CENT	3717 33R	I714
JTAG_TDI_CENT		I710
JTAG_TMS		I712
JTAG_TCK		I708
JTAG_WE		I731
JTAG_RY_BY		I732
		I735

3718 10K, 3719 10K — OPTION

OPTION: 0001, 0002

Connection Splitted GND plane: 2700 10n, 2701 10n, 2702 10n, 2703 10n, 2704 10n, 2705 10n, 2706 10n, 2707 10n

TR20040_001.eps
14062004

0001 I7
0002 I8
1700 B1
1702 F5
1703 C6
1705 E8
2700 I10
2701 I11
2702 I10
2703 I11
2704 I10
2705 I11
2706 I10
2707 I11
3702 H4
3703 H5
3704 H4
3705 H5
3706 I4
3707 I5
3708 C5
3709 C4
3710 C4
3711 C4
3712 C5
3713 B1:
3714 B1:
3715 B1:
3716 B1:
3717 C1:
3718 D1:
3719 D1:
4701-1 B
4701-2 B
4701-3 B
4701-4 B
4702-1 C
4702-2 C
4702-3 C
4702-4 D
4703-1 D
4703-2 C
4703-3 C
4703-4 C
4704-1 E
4704-2 E
4704-3 D
4704-4 E
4705-1 D
4705-2 E
4705-3 F
4705-4 E
4706-1 F
4706-2 F
4706-3 F
4706-4 D
4707 F2
I700 C5
I701 C5
I702 D5
I703 D5
I704 D5
I705 D5
I706 B14
I707 D5
I708 C14
I709 D5
I710 C14
I711 D5
I712 C14
I713 E5
I714 C14
I715 H3
I716 H3
I717 H3
I718 I3
I719 I3
I720 C12
I721 E2
I722 E2
I723 F2
I724 F9
I731 C14
I732 C14
I735 C14
L700 G3
L701 G3
L702 H3
L703 H3

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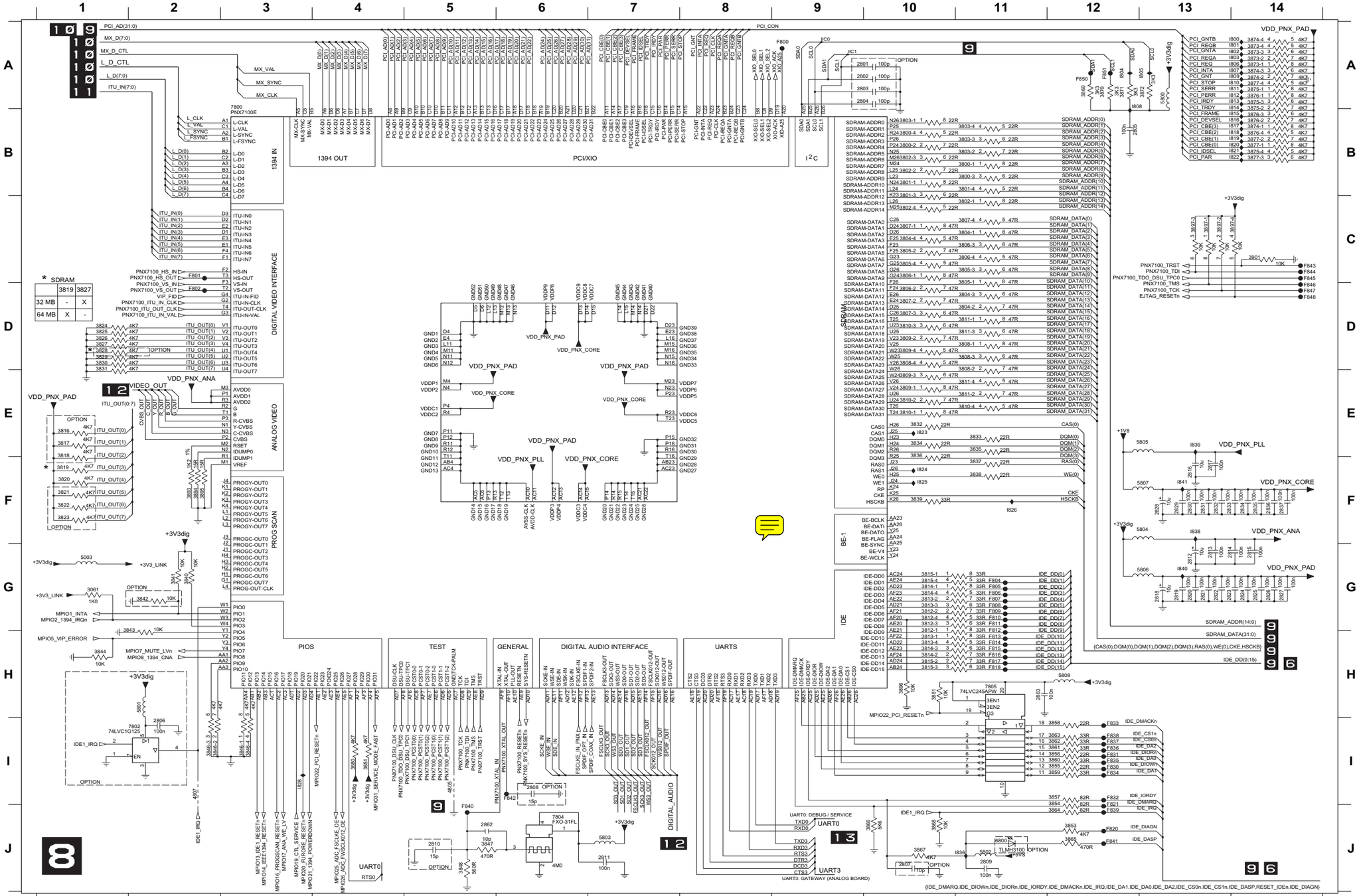
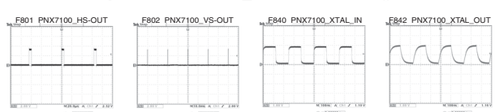
FEBE: BE Chrysalis





2801 A9	3832 E10	F841 J12
2802 A9	3833 E11	F842 I6
2803 A9	3834 E10	F843 C14
2804 A9	3835 E11	F844 C14
2805 B12	3836 F10	F845 C14
2806 I2	3837 F11	F846 D14
2807 J10	3838 F11	F847 D14
2808 I6	3839 F10	F848 D14
2809 J11	3840 G2	F850 A12
2810 J5	3841 G2	F851 A12
2811 J7	3842 G2	I800 A14
2812 G13	3843 H2	I801 A14
2813 G13	3844 H1	I802 A14
2814 G14	3846-1 I3	I803 A14
2815 G14	3846-2 I2	I804 A12
2816 F13	3846-3 I2	I805 A13
2817 F13	3846-4 I3	I806 A14
2818 G13	3847 J5	I807 A14
2819 G13	3848 J5	I808 A12
2820 G13	3851 I4	I809 A14
2821 G13	3853 J12	I810 A14
2822 G13	3854 J12	I811 A14
2823 G13	3855 I12	I812 A14
2824 G14	3856 I12	I813 A14
2825 G14	3857 I12	I814 A14
2826 G14	3858 I12	I815 B14
2827 G14	3859 I12	I816 B14
2828 F13	3860 I12	I817 B14
2829 F13	3861 I12	I818 B14
2830 F13	3862 I12	I819 B14
2831 F13	3863 I12	I820 B14
2832 F13	3864 J12	I821 B14
2833 F13	3865 J12	I822 B14
2834 F13	3866 J10	I823 E10
2835 F14	3867 J10	I824 F10
2836 F14	3868 J10	I825 F10
2837 F14	3869 A12	I826 F11
2862 J5	3870 A12	I828 I3
3863 H11	3871 A12	I836 J11
3061 G1	3872 A13	I838 F13
3800-1 B11	3873-1 A14	I839 E13
3800-2 B10	3873-2 A14	I840 G13
3800-3 B11	3873-3 A14	I841 F13
3800-4 B10	3873-4 A14	
3801-1 B10	3874-1 B14	
3801-3 C10	3874-2 A14	
3801-4 B11	3874-3 A14	
3802-1 C11	3874-4 A14	
3802-2 B10	3875-1 A14	
3802-3 B10	3875-2 B14	
3802-4 C10	3875-3 A14	
3803-1 B10	3875-4 B14	
3803-2 B11	3876-1 A14	
3803-3 B11	3876-2 B14	
3803-4 B11	3876-3 B14	
3804-1 C11	3876-4 B14	
3804-2 D11	3877-1 B14	
3804-3 D11	3877-2 B14	
3804-4 C10	3877-3 B14	
3805-1 D11	3877-4 A14	
3805-2 C10	3880 I4	
3805-3 C11	3881 H10	
3805-4 C10	3893 F2	
3806-1 C10	3894 F2	
3806-2 D10	3895 F2	
3806-3 C11	3896 H10	
3806-4 C11	3897-1 C13	
3807-1 C10	3897-2 C13	
3807-2 D10	3897-3 C13	
3807-3 D10	3897-4 C14	
3807-4 C11	3901 C14	
3808-1 D11	4805 I5	
3808-2 E11	4807 I2	
3808-3 D11	5003 G1	
3808-4 D10	5800 A13	
3809-1 E10	5801 H2	
3809-2 D10	5802 J11	
3809-3 E10	5803 J7	
3809-4 D10	5804 F13	
3810-1 E10	5805 E13	
3810-2 E10	5806 G13	
3810-3 D10	5807 F13	
3810-4 E11	5808 H12	
3811-1 D11	6800 J11	
3811-2 E11	7800 B3	
3811-3 D11	7802 I2	
3811-4 E11	7804 J6	
3812-1 H10	7805 H11	
3812-2 G10	F800 A9	
3812-3 G10	F801 C2	
3812-4 G10	F802 D2	
3813-1 H10	F804 G11	
3813-2 G10	F805 G11	
3813-3 G10	F806 G11	
3813-4 H10	F807 G11	
3814-1 G10	F808 G11	
3814-2 H10	F809 G11	
3814-3 H10	F810 G11	
3814-4 G10	F811 G11	
3815-1 G10	F812 H11	
3815-2 H10	F813 H11	
3815-3 H10	F814 H11	
3815-4 G10	F815 H11	
3816 E1	F816 H11	
3817 E1	F817 H11	
3818 F1	F818 H11	
3819 F1	F820 J12	
3820 F1	F821 J12	
3821 F1	F830 I12	
3822 F1	F831 I12	
3823 F1	F832 I12	
3824 D1	F833 I12	
3825 D1	F834 I12	
3826 D1	F835 I12	
3827 D1	F836 I12	
3828 D1	F837 I12	
3829 D1	F838 I12	
3830 D1	F839 J12	
3831 E1	F840 J5	

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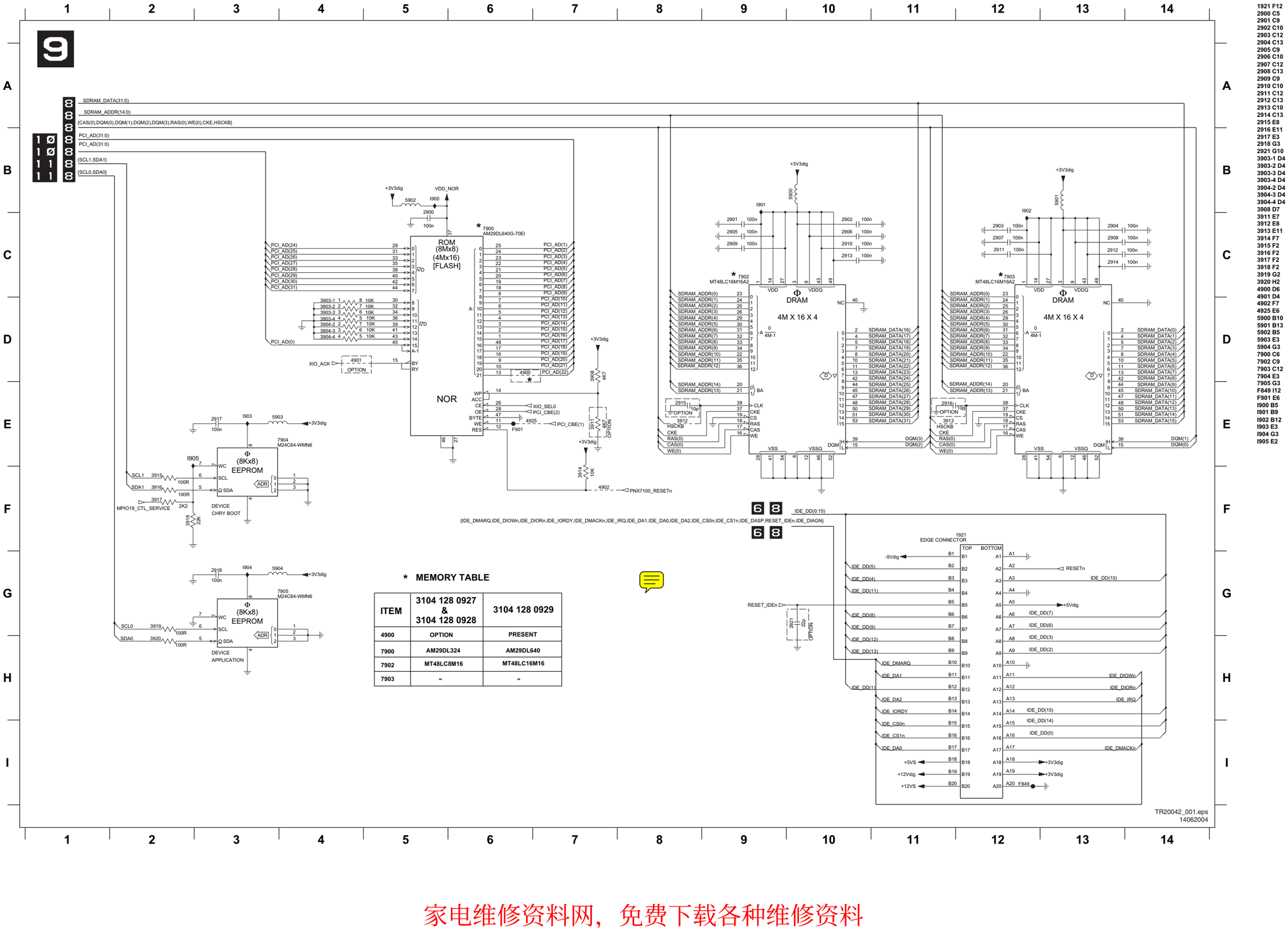
FEBE: BE Flash, EEPROM & SDRAM



* MEMORY TABLE

ITEM	3104 128 0927 & 3104 128 0928	3104 128 0929
4900	OPTION	PRESENT
7900	AM29DL324	AM29DL640
7902	MT48LC8M16	MT48LC16M16
7903	"	"

1921 F12
2900 C5
2901 C9
2902 C10
2903 C12
2904 C13
2905 C9
2906 C10
2907 C12
2908 C13
2909 C9
2910 C10
2911 C12
2912 C13
2913 C10
2914 C13
2915 E8
2916 E11
2917 E3
2918 G3
2921 G10
3903-1 D4
3903-2 D4
3903-3 D4
3903-4 D4
3904-2 D4
3904-3 D4
3904-4 D4
3908 D7
3911 E7
3912 E8
3913 E11
3914 F7
3915 F2
3916 F2
3917 F2
3918 F2
3919 G2
3920 H2
4900 D6
4901 D4
4902 F7
4925 E6
5900 B10
5901 B13
5902 B5
5903 E3
5904 G3
7900 C6
7902 C9
7903 C12
7904 E3
7905 G3
F849 I12
F901 E6
I900 B5
I901 B9
I902 B12
I903 E3
I904 G3
I905 E2

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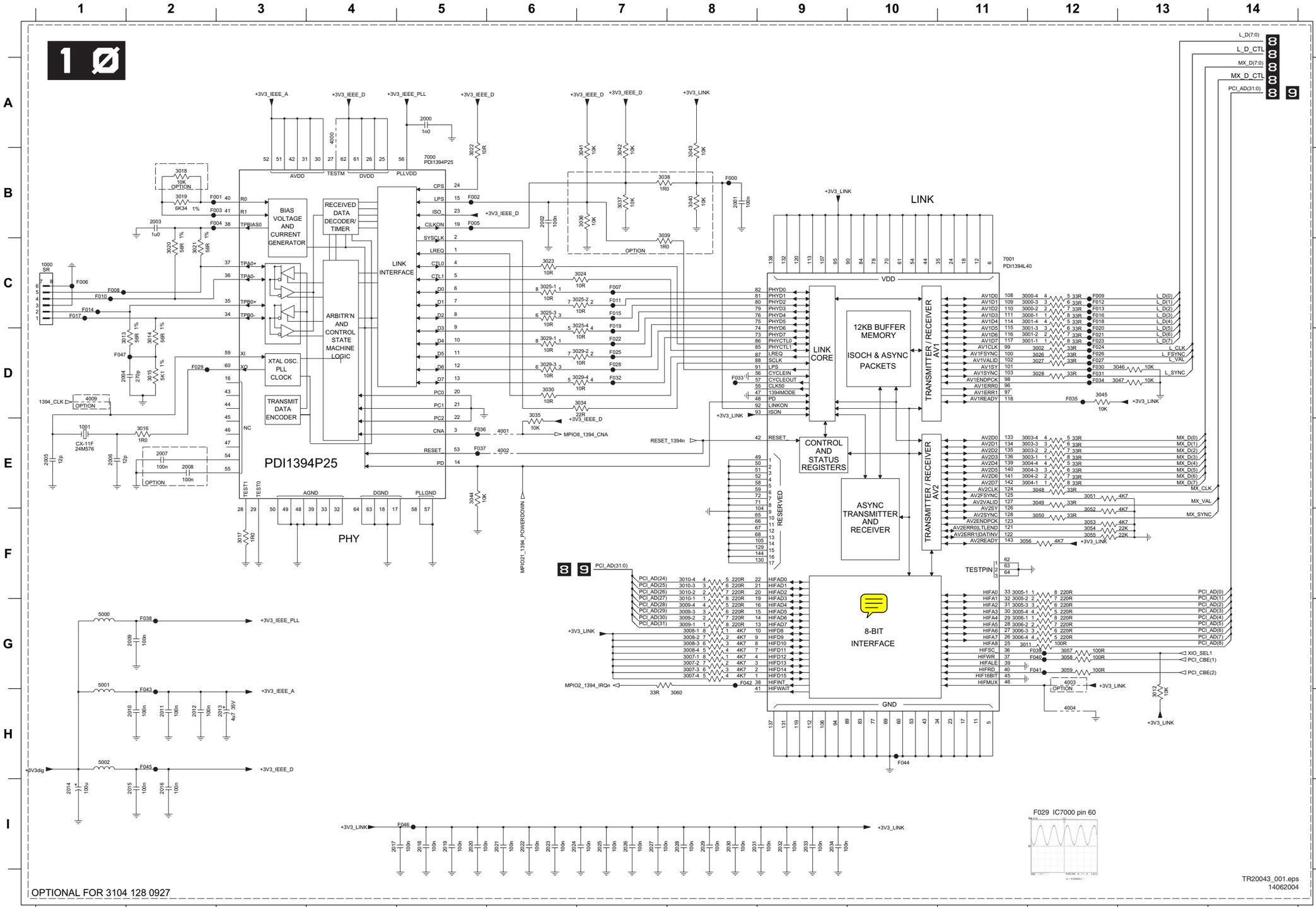
FEBE: BE DV In IEEE1394



1000 C1	3046 D13
1001 E1	3047 D13
2000 A5	3048 E12
2001 B8	3049 E12
2002 B6	3050 F12
2003 B2	3051 E12
2004 D1	3052 F12
2005 E1	3053 F12
2006 E1	3054 F12
2007 E2	3055 F12
2008 E2	3056 F11
2009 G2	3057 G12
2010 H2	3058 G12
2011 H2	3059 G12
2012 H2	3060 H8
2013 H3	4000 A4
2014 I1	4001 E6
2015 I2	4002 E6
2016 I2	4003 G12
2017 I4	4004 H12
2018 I5	4009 D1
2019 I5	5000 G1
2020 I5	5001 G1
2021 I6	5002 H1
2022 I6	7000 B5
2023 I6	7001 C11
2024 I6	F000 B8
2025 I7	F001 B3
2026 I7	F002 B5
2027 I7	F003 B3
2028 I8	F004 B3
2029 I8	F005 B5
2030 I8	F006 C1
2031 I8	F007 C7
2032 I9	F008 C1
2033 I9	F009 C12
2034 I9	F010 C1
3000-1 C12	F011 C7
3000-2 C12	F012 C12
3000-3 C12	F013 C12
3000-4 C12	F014 C1
3001-1 D12	F015 C7
3001-2 D12	F016 C12
3001-3 D12	F017 C1
3001-4 C12	F018 C12
3002 D12	F019 C7
3003-1 E12	F020 D12
3003-2 E12	F021 D12
3003-3 E12	F022 D7
3003-4 E12	F023 D12
3004-1 E12	F024 D12
3004-2 E12	F025 D7
3004-3 E12	F026 D12
3004-4 E12	F027 D12
3005-1 F12	F028 D7
3005-2 G12	F029 D2
3005-3 G12	F030 D12
3005-4 G12	F031 D12
3006-1 G12	F032 D7
3006-2 G12	F033 D8
3006-3 G12	F034 D12
3006-4 G12	F035 D12
3007-1 G8	F036 E5
3007-2 G8	F037 E5
3007-3 G8	F038 G2
3007-4 G8	F039 G12
3008-1 G8	F040 G12
3008-2 G8	F041 G12
3008-3 G8	F042 G8
3008-4 G8	F043 H2
3009-1 G8	F044 H10
3009-2 G8	F045 H2
3009-3 G8	F046 I5
3009-4 G8	F047 D1
3010-1 G8	
3010-2 F8	
3010-3 F8	
3010-4 F8	
3011 G12	
3012 H13	
3013 D1	
3014 D2	
3015 D2	
3016 E2	
3017 F3	
3018 B2	
3019 B2	
3020 C2	
3021 C2	
3022 B5	
3023 C6	
3024 C7	
3025-1 C6	
3025-2 C7	
3025-3 C6	
3025-4 C7	
3026 D12	
3027 D12	
3028 D12	
3029-1 D6	
3029-2 D7	
3029-3 D6	
3029-4 D7	
3030 D6	
3034 D7	
3035 D6	
3036 B7	
3037 B7	
3038 B7	
3039 B7	
3040 B8	
3041 B7	
3042 B7	
3043 B8	
3044 E5	
3045 D12	

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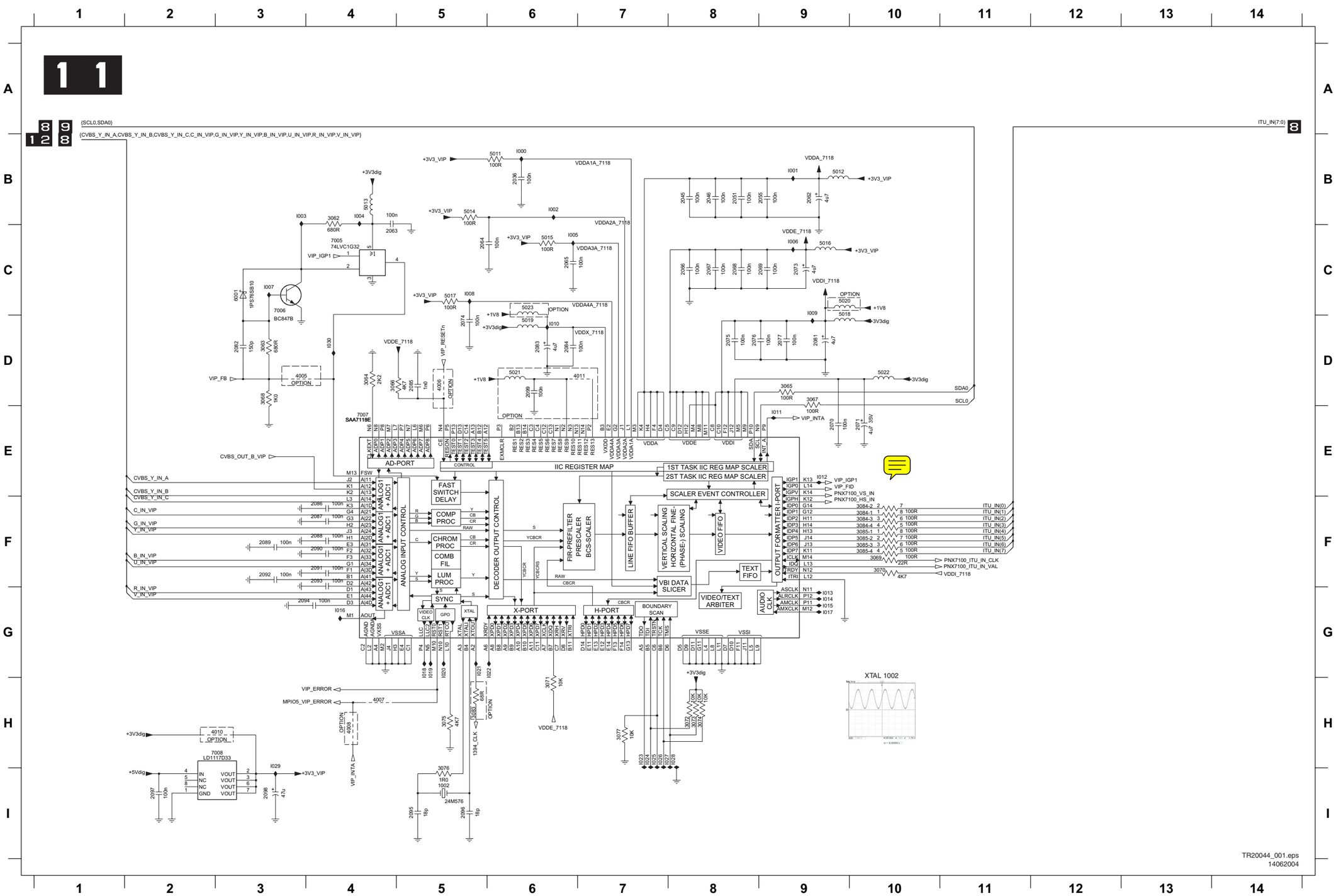
FEBE: BE Video In Processing (VIP)



1002 I5
2036 B6
2045 B8
2046 B8
2051 B8
2055 B9
2062 B9
2063 C4
2064 C5
2065 C6
2066 C8
2067 C8
2068 C8
2069 C9
2070 E9
2071 E10
2073 C9
2074 D5
2075 D8
2076 D8
2077 D9
2081 D9
2082 D3
2083 D6
2084 D6
2085 D5
2086 F4
2087 F4
2088 F4
2089 F3
2090 F4
2091 F4
2092 F3
2093 F4
2094 G3
2095 I5
2096 I5
2097 I2
2098 I3
2099 D6
3062 B4
3063 D3
3064 D4
3065 D9
3066 D4
3067 D9
3068 D3
3069 F10
3070 F10
3071 H6
3072 H8
3073 H8
3074 H8
3075 H5
3076 I5
3077 H7
3083 H5
3084-1 F10
3084-2 F10
3084-3 F10
3084-4 F10
3085-1 F10
3085-2 F10
3085-3 F10
3085-4 F10
4005 D3
4006 D5
4007 H4
4008 H4
4010 H3
4011 D7
5011 B6
5012 B9
5013 B4
5014 B5
5015 C6
5016 C9
5017 C5
5018 D9
5019 D6
5020 C9
5021 D6
5022 D10
5023 C6
6001 C3
7005 C4
7006 C3
7007 E4
7008 H3
I000 B6
I001 B9
I002 B6
I003 B3
I004 B4
I005 C6
I006 C9
I007 C3
I008 C5
I009 C9
I010 D6
I011 E9
I012 E9
I013 G9
I014 G9
I015 G9
I016 G4
I017 G9
I018 G5
I019 G5
I020 G5
I021 G5
I022 G6
I023 H7
I024 H7
I025 H7
I026 H7
I027 H7
I028 H8
I029 H3
I030 D4

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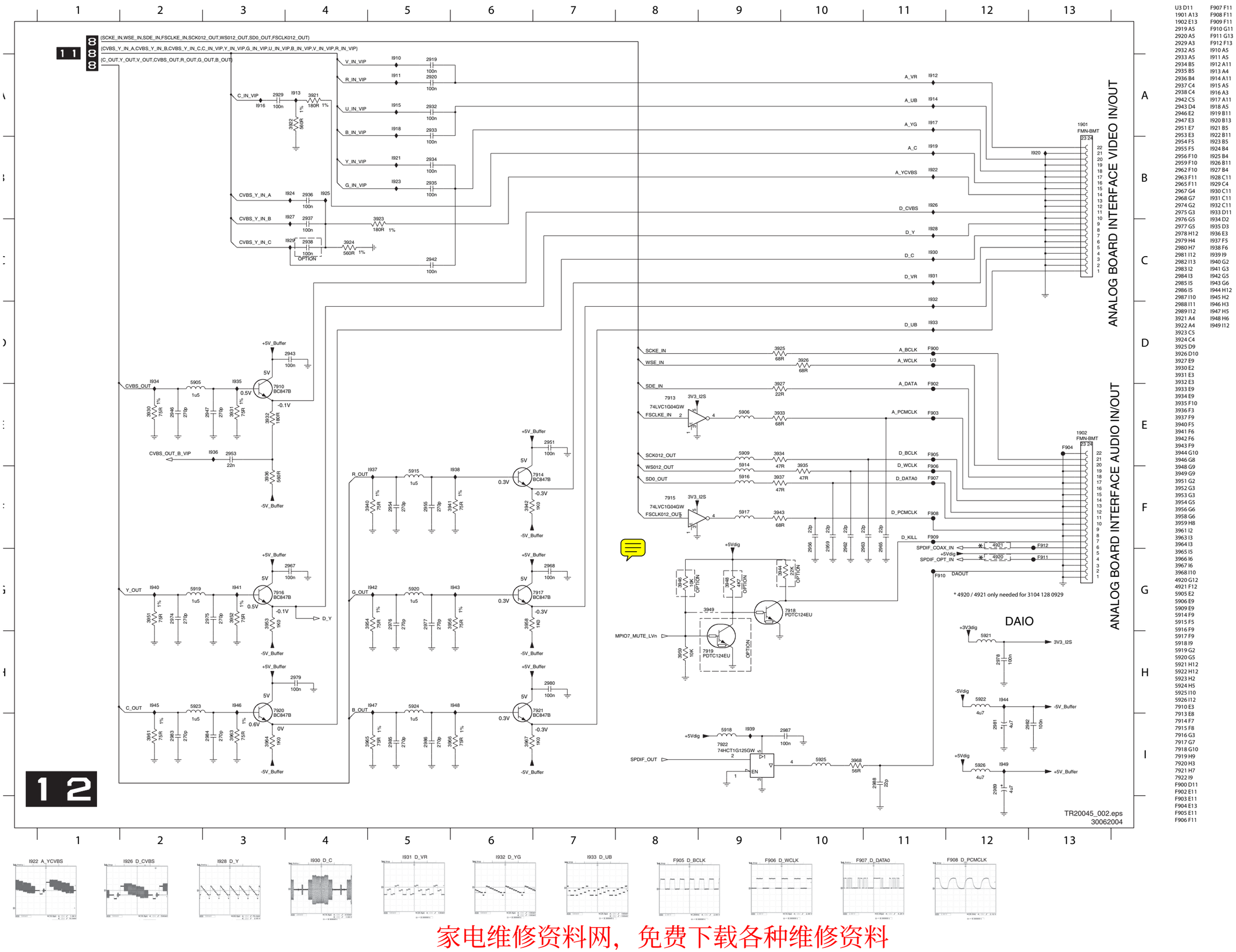
FEBE: BE Audio & Video In/Out



U3 D11
1901 A13
1902 E13
2919 A5
2920 A5
2929 A3
2932 A5
2933 A5
2934 B5
2935 B5
2936 B4
2937 C4
2938 C4
2942 C5
2943 D4
2946 E2
2947 E3
2951 E7
2953 E3
2954 F5
2955 F5
2956 F10
2959 F10
2962 F10
2963 F11
2965 F11
2967 G4
2968 G7
2974 G2
2975 G3
2976 G5
2977 G5
2978 H12
2979 H4
2980 H7
2981 I12
2982 I13
2983 I2
2984 I3
2985 I5
2986 I5
2987 I10
2988 I11
2989 I12
3921 A4
3922 A4
3923 C5
3924 C4
3925 D9
3926 D10
3927 E9
3930 E2
3931 E3
3932 E3
3933 E9
3934 E9
3935 F10
3936 F3
3937 F9
3940 F5
3941 F6
3942 F6
3943 F9
3944 G10
3946 G8
3948 G9
3949 G9
3951 G2
3952 G3
3953 G3
3954 G5
3956 G6
3958 G6
3959 H8
3961 I2
3963 I3
3964 I3
3965 I5
3966 I6
3967 I6
3968 I10
4920 G12
4921 F12
5905 E2
5906 E9
5909 E9
5914 F9
5915 F5
5916 F9
5917 F9
5918 I9
5919 G2
5920 G5
5921 H12
5922 H12
5923 H2
5924 H5
5925 I10
5926 I12
7910 E3
7913 E8
7914 F7
7915 F8
7916 G3
7917 G7
7918 G10
7919 H9
7920 H3
7921 H7
7922 I9
F900 D11
F902 E11
F903 E11
F904 E13
F905 E11
F906 F11
F907 F11
F908 F11
F909 F11
F910 G11
F911 G13
F912 F13
I910 A5
I911 A5
I912 A11
I913 A4
I914 A11
I915 A5
I916 A3
I917 A11
I918 A5
I919 B11
I920 B13
I921 B5
I922 B11
I923 B5
I924 B4
I925 B4
I926 B11
I927 B4
I928 C11
I929 C4
I930 C11
I931 C11
I932 C11
I933 D11
I934 D2
I935 D3
I936 E3
I937 F5
I938 F6
I939 I9
I940 G2
I941 G3
I942 G5
I943 G6
I944 H12
I945 H2
I946 H3
I947 H5
I948 H6
I949 I12

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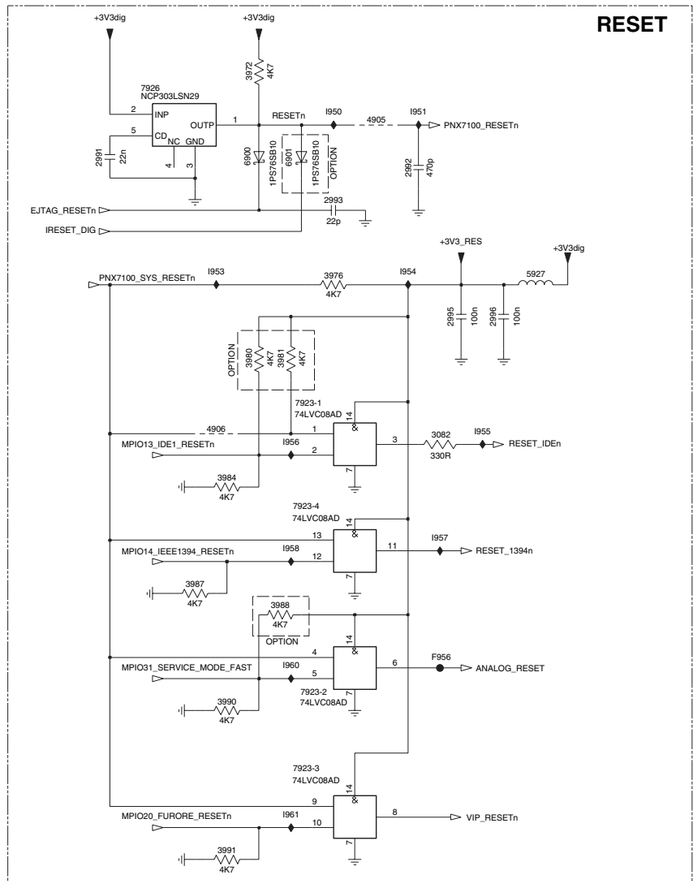
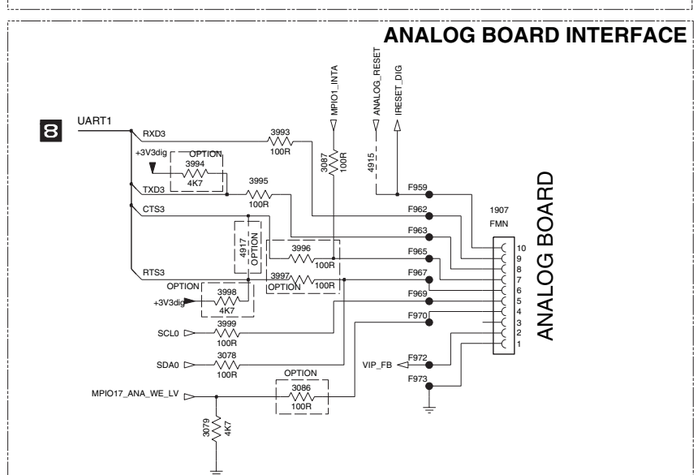
FEBE: BE Supply, Reset, UART, Encorder I2S Clock Source Switch

13

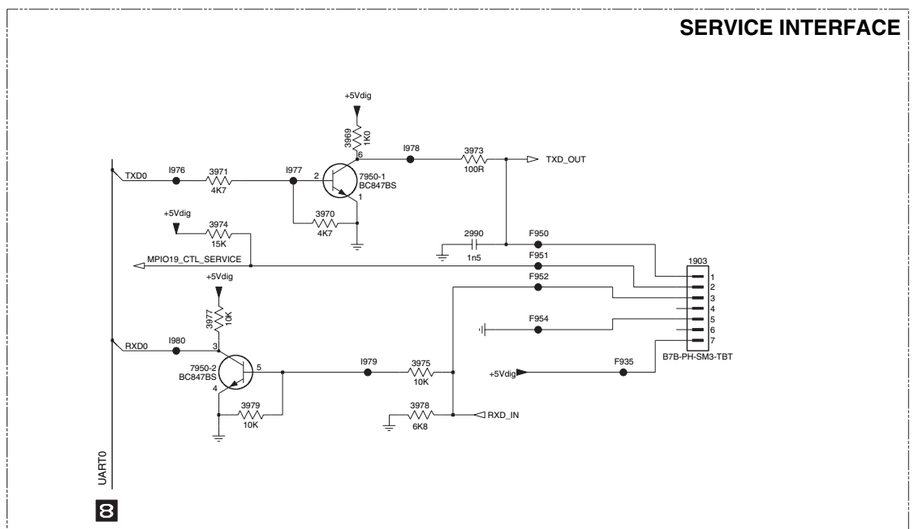
RESET



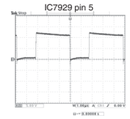
ANALOG BOARD INTERFACE



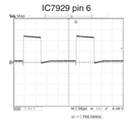
SERVICE INTERFACE



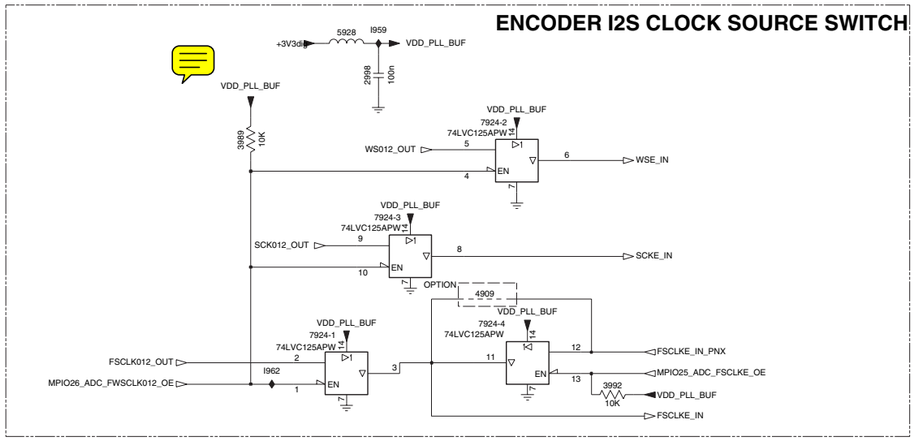
IC7929 pin 5



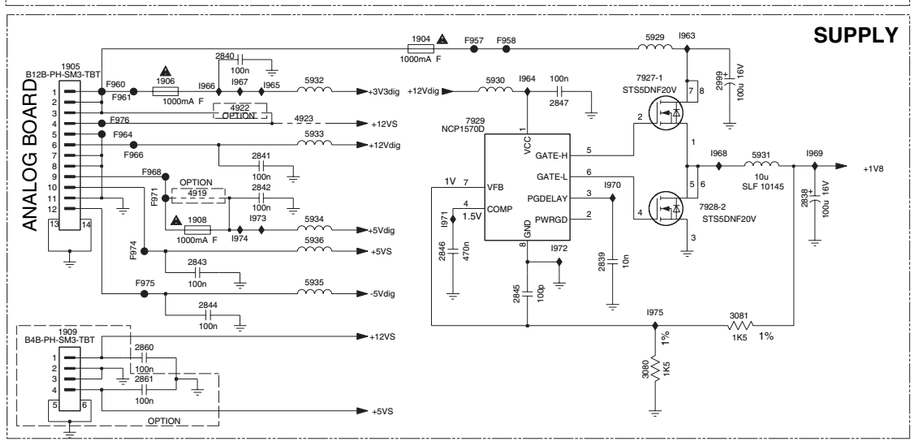
IC7929 pin 6



ENCODER I2S CLOCK SOURCE SWITCH



SUPPLY



0010
Hole 4.0 mm with Cu 8.0 mm

TR20046_002.eps
30062004

0010 I13
1903 B11
1904 G9
1905 G7
1906 G8
1907 H4
1908 H8
1909 I7
2838 H12
2839 I10
2840 G8
2841 H8
2842 H8
2843 I8
2844 I8
2845 I10
2846 I9
2847 H10
2860 I7
2861 I7
2990 B10
2991 A2
2992 A4
2993 B3
2995 B4
2996 B4
2998 D9
2999 G11
3078 I3
3079 I2
3080 I11
3081 I11
3082 C4
3086 I3
3087 G3
3969 A9
3970 B9
3971 A8
3972 A3
3973 A10
3974 B8
3975 C9
3976 B3
3977 B8
3978 C9
3979 C8
3980 C3
3981 C3
3984 C3
3987 D2
3988 D3
3989 E8
3990 E3
3991 F3
3992 G11
3993 G3
3994 G2
3995 G3
3996 H3
3997 H3
3998 H3
3999 H3
4905 A4
4906 C3
4909 F10
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4922 H8
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5929 G11
5930 G10
5931 H12
5932 G9
5933 H9
5934 H9
5935 I9
5936 H9
6900 A3
6901 A3
7923-1 C3
7923-2 E3
7923-3 E3
7923-4 D3
7924-1 F9
7924-2 E10
7924-3 E9
7924-4 F10
7926 A2
7927-1 G11
7928-2 H11
7929 H10
7950-1 A9
7950-2 C8
F935 C11
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F957 G10
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F960 G7
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F969 H4
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F971 H7
F972 I4
F973 I4
F974 I7
F975 I7
F976 H7
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I958 D3
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I975 I11
I976 A8
I977 A8
I978 A9
I979 C9
I980 B8

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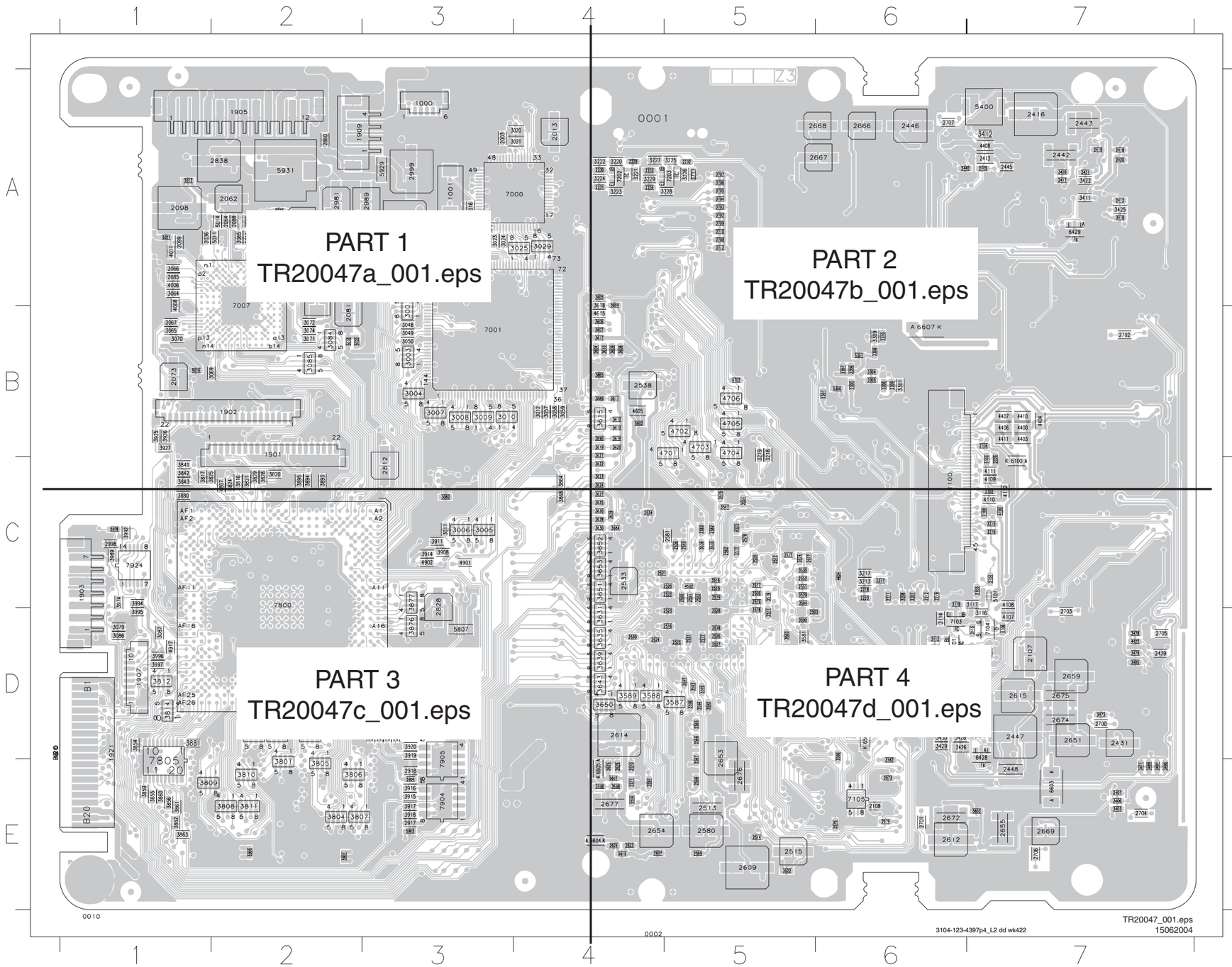
Layout: FEBE Top View



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1100	C6	2562	C5	3066	A1	3595	D5	3920	D3	7104	D7
1901	B2	2563	D5	3067	B1	3596	D5	3925	B1	7105	E6
1902	B2	2564	D5	3069	B2	3597	D5	3926	B1	7202	A4
1903	C1	2565	D5	3070	B1	3598	E4	3927	B1	7203	A5
1905	A2	2566	D5	3071	B2	3599	E4	3974	C1	7502	D6
1907	D1	2567	E5	3072	B2	3604	A4	3989	C1	7506	D6
1909	A2	2568	E5	3074	B2	3605	A4	3992	C1	7800	C2
2003	A3	2569	E5	3076	A2	3606	B4	3994	C1	7805	E1
2013	A4	2570	E4	3079	D1	3607	B4	3995	D1	7904	E3
2014	A3	2571	E4	3082	C3	3608	B4	3996	D1	7905	E3
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2062	A2	2574	E6	3084	B2	3610	B4	4006	A1		
2064	A2	2575	E6	3085	B2	3611	B4	4008	A1		
2065	A2	2576	D6	3086	D1	3612	B4	4011	A1		
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2104	B7	2623	E4	3217	C6	3631	D4	4502	C5		
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2211	C6	2653	D5	3222	A4	3651	C4	4525	C5		
2212	C6	2654	E4	3223	A4	3652	C4	4604	C6		
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2218	C6	2659	D7	3225	A5	3684	C4	4615	B4		
2219	C6	2666	A6	3226	A5	3689	B4	4701	B5		
2223	C6	2667	A6	3227	A4	3690	B4	4702	B5		
2229	A4	2668	A6	3228	A5	3702	A5	4703	B5		
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2231	A4	2672	E6	3301	B6	3704	A5	4705	B5		
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2300	B6	2677	E4	3308	B6	3708	A5	4901	C3		
2301	B6	2700	D7	3309	B6	3709	A5	4902	C3		
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2413	A7	2801	D3	3422	A7	3804	E2	5016	B1		
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2427	D7	2818	D3	3471	E7	3811	E2	5023	A2		
2431	D7	2828	C3	3473	D7	3812	D1	5101	C7		
2439	D7	2838	A2	3478	D7	3814	D1	5103	C7		
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2442	A7	2917	E3	3485	D7	3817	C1	5301	B6		
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2501	C5	3001	B3	3515	C5	3841	C1	5607	E4		
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2503	D5	3003	B3	3517	C5	3843	C1	5802	D3		
2509	C5	3004	B3	3518	D5	3853	D3	5806	D3		
2511	D5	3005	C3	3519	C5	3854	D1	5807	D3		
2512	C5	3006	C3	3520	C5	3855	E1	5900	E2		
2513	E5	3007	B3	3522	E5	3856	E1	5901	E2		
2514	E5	3008	B3	3524	D5	3859	E1	5903	E3		
2515	E5	3009	B3	3527	C5	3860	E1	5904	E3		
2516	D5	3010	B3	3529	C5	3861	E1	5928	C1		
2517	D5	3011	C3	3530	C5	3862	E1	5929	A3		
2518	D5	3012	B4	3534	D5	3863	E1	5931	A2		
2519	C5	3016	A3	3535	C5	3864	C4	6100	C7		
2520	C5	3020	A4	3536	C5	3865	B4	6426	D6		
2521	C4	3021	A4	3547	C5	3867	D3	6427	D6		
2522	C5	3023	A3	3548	D5	3868	C4	6428	D7		
2523	D5	3024	A3	3551	C5	3873	D3	6429	A7		
2524	D4	3025	A4	3561	D6	3876	D3	6500	D6		
2525	D5	3026	A3	3574	C5	3877	C3	6501	D6		
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2527	D5	3028	A3	3578	D5	3881	D1	6503	D6		
2528	D5	3029	A4	3580	D6	3893	C2	6603	E7		
2529	C5	3030	A3	3581	D5	3894	C2	6604	E4		
2530	D4	3034	A3	3582	E6	3895	C2	6605	E4		
2531	D5	3048	B3	3586	D6	3908	C3	6607	B6		
2533	C4	3049	B3	3587	D5	3911	C3	6800	D3		
2534	C4	3050	B3	3588	D4	3914	C3	7000	A4		
2536	C5	3057	B4	3589	D4	3915	E3	7001	B3		
2538	B4	3058	B4	3591	E4	3916	E3	7007	A2		

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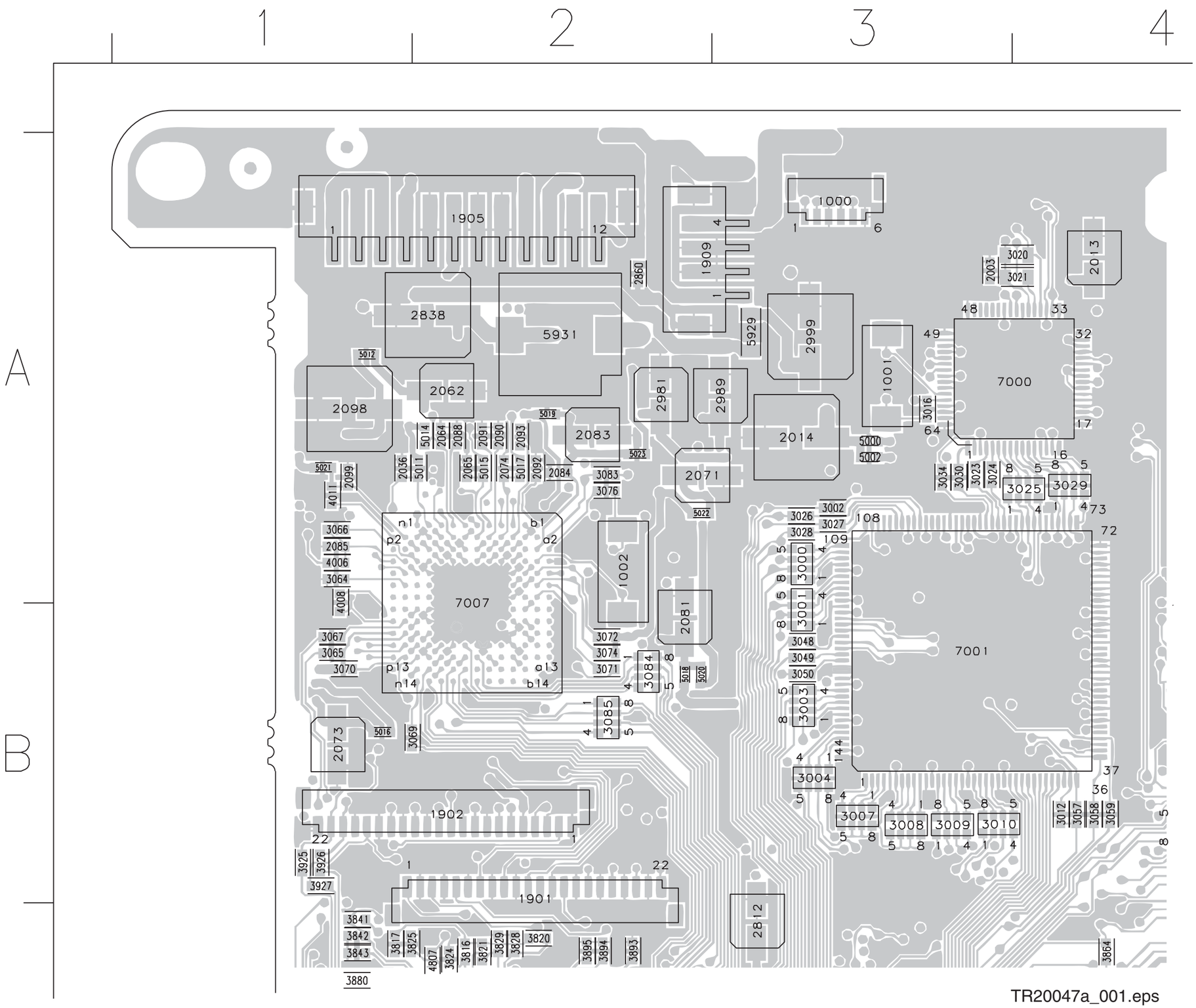
Layout: FEBE Top View Part 1



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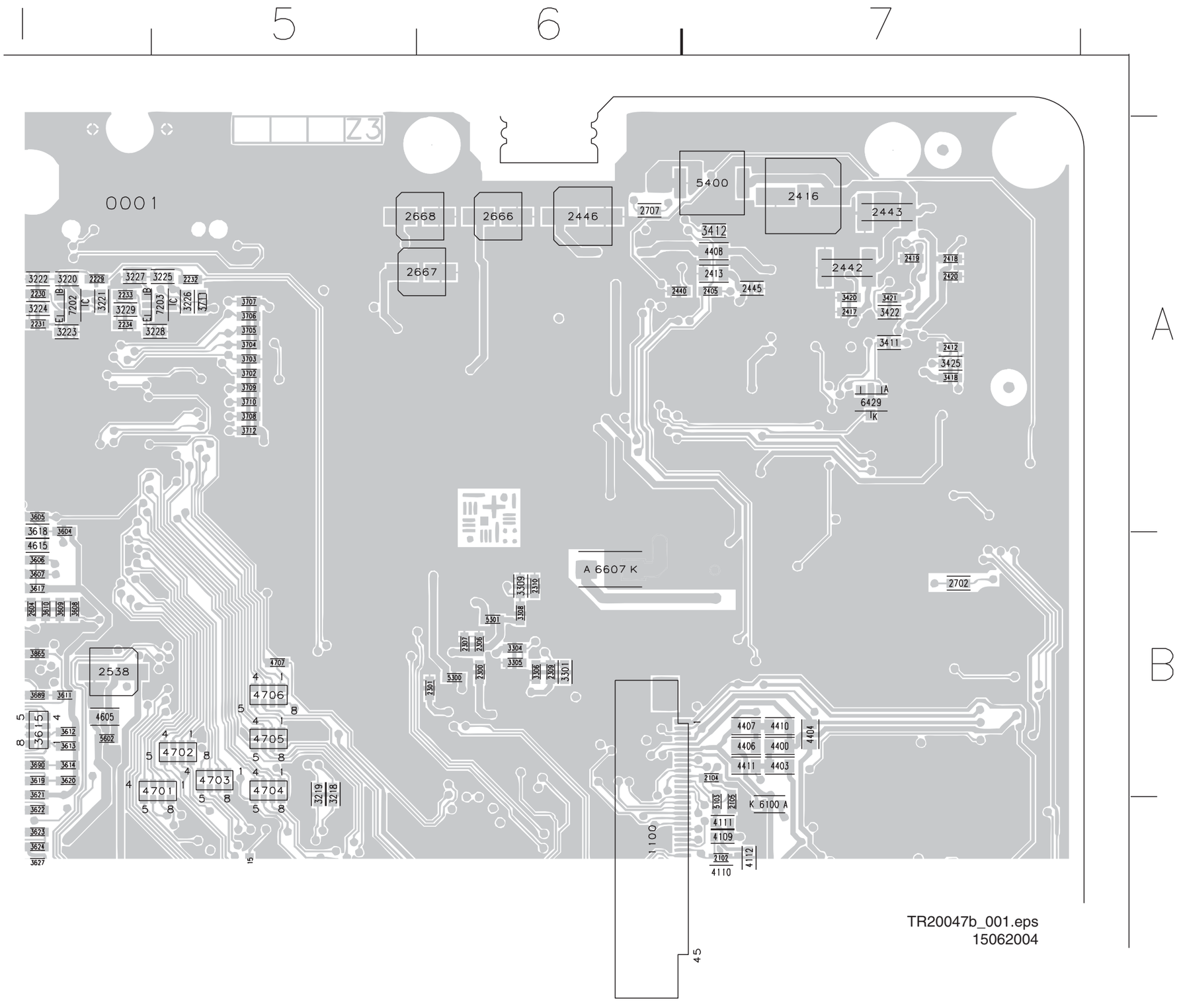
Layout: FEBE Top View Part 2



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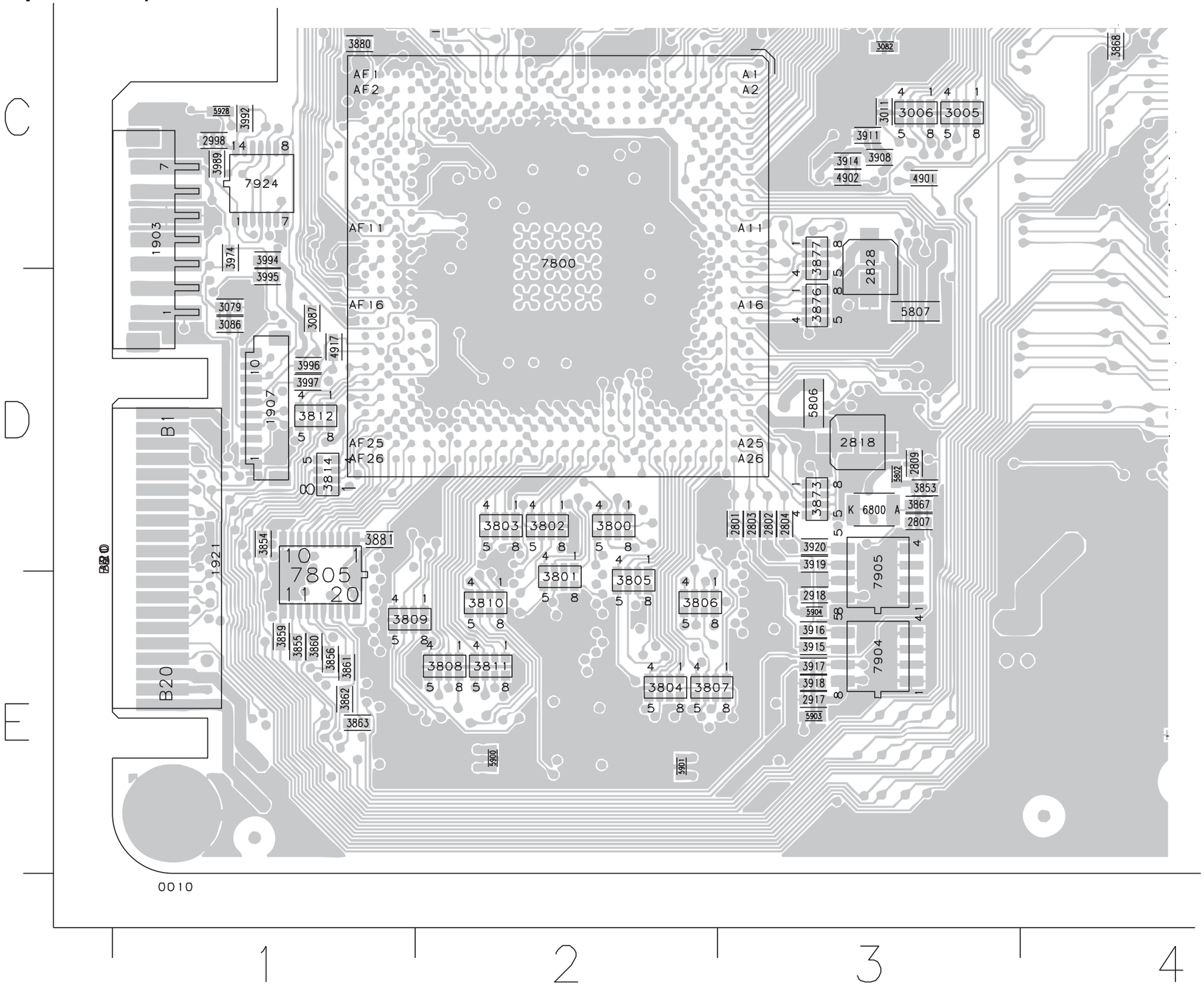
Layout: FEBE Top View Part 3



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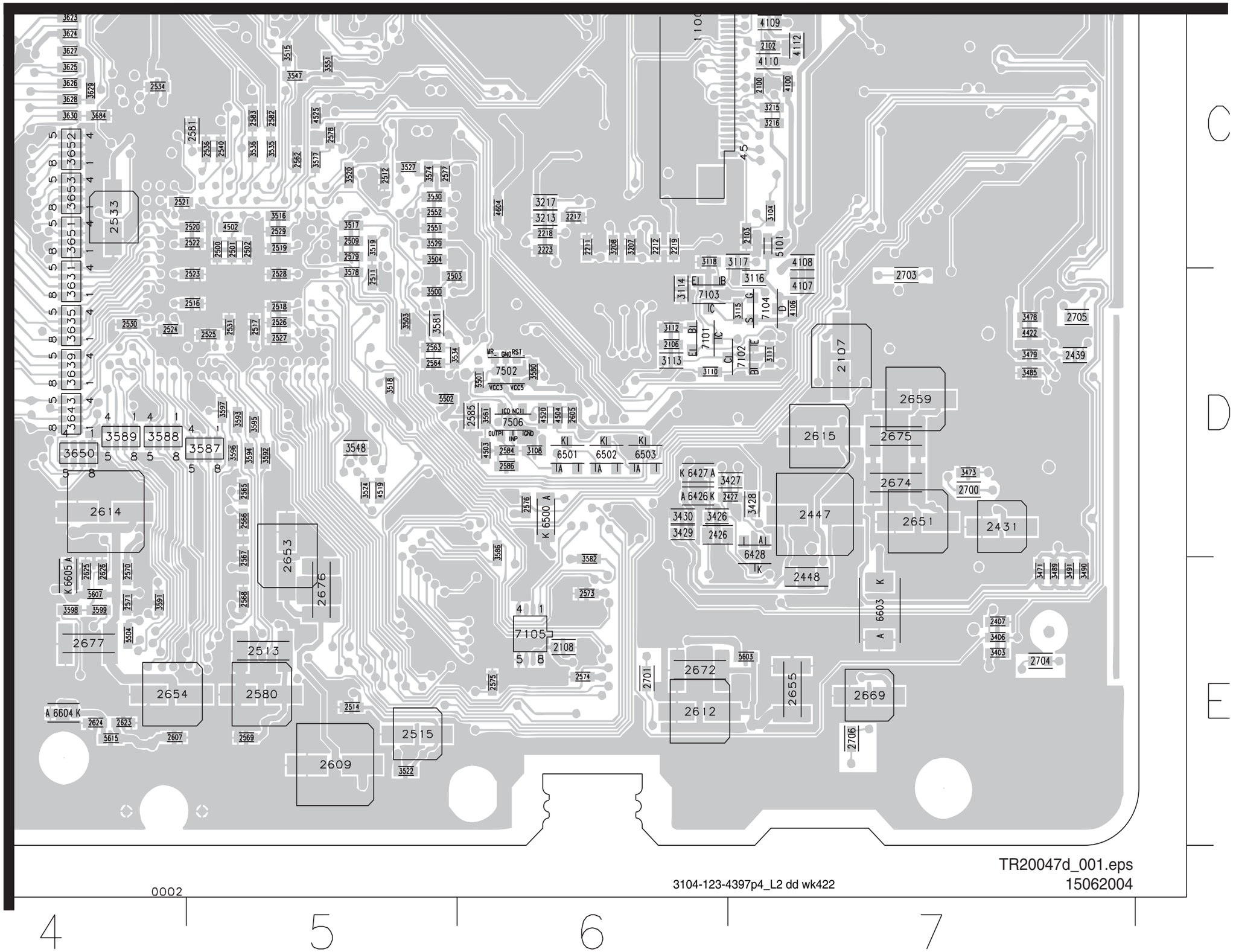
Layout: FEBE Top View Part 4



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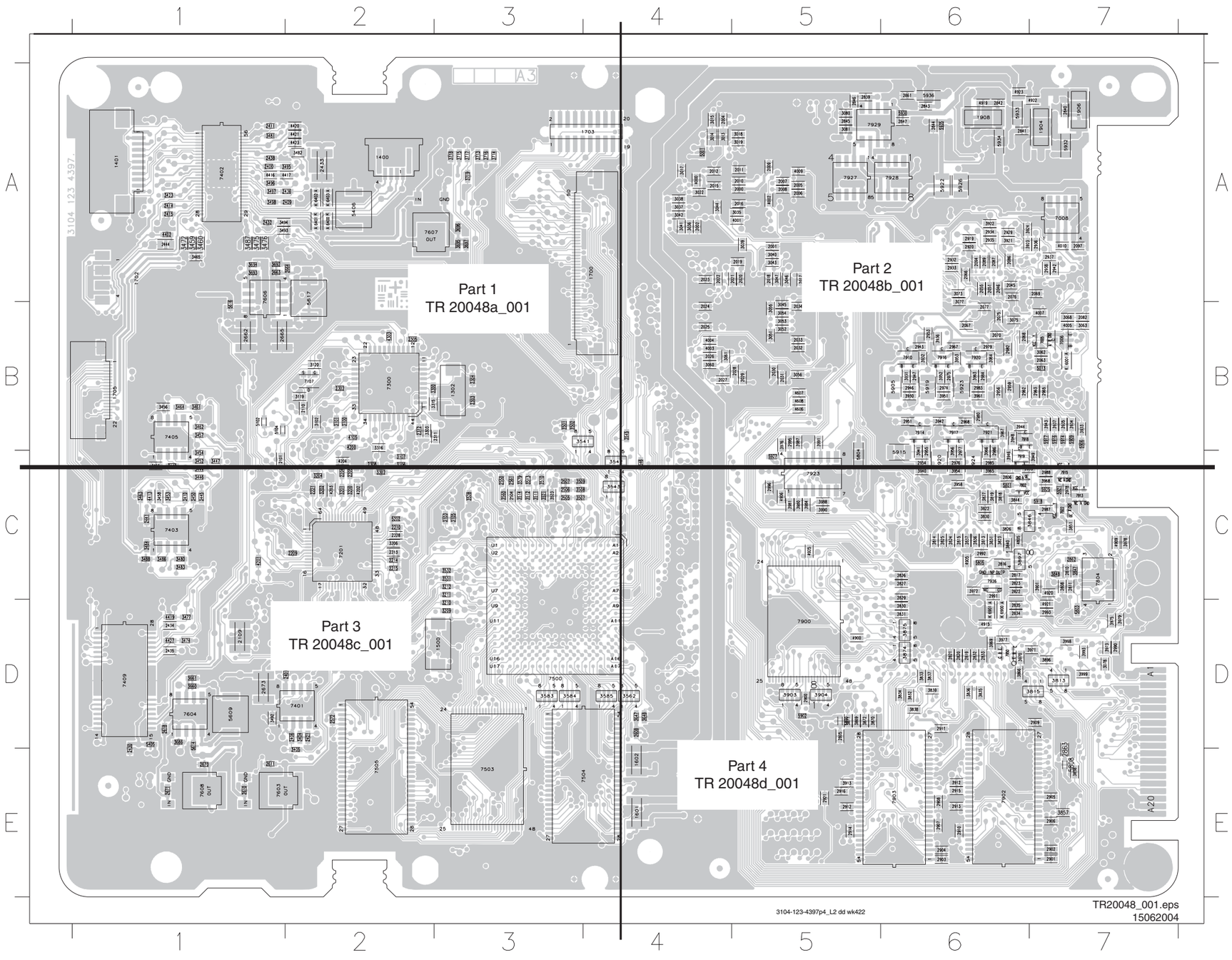
Layout: FEBE Bottom View



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2005	A5	2608	D4	2967	B6	3452	C1	3836	D6	4202	C2	7603	E1				
2006	A5	2610	E1	2968	B6	3453	C1	3837	D6	4203	C2	7604	D1				
2007	A5	2611	E1	2974	B6	3454	C1	3838	D6	4204	C2	7606	A1				
2008	A5	2618	D1	2975	B6	3455	C1	3839	D6	4303	B2	7607	A2				
2009	A5	2662	B1	2976	C6	3456	B1	3840	C6	4402	A1	7608	E1				
2010	A5	2663	A1	2977	C6	3457	B1	3844	C6	4413	C1	7802	C6				
2011	A5	2664	A2	2978	C7	3458	C1	3846	C7	4416	A1	7804	C7				
2012	A4	2665	B1	2979	B6	3459	A1	3847	C7	4417	A2	7900	D5				
2015	A4	2670	E1	2980	B6	3460	A1	3848	C7	4419	D1	7902	E6				
2016	A5	2671	E1	2982	B6	3461	B1	3851	C7	4420	A2	7903	E6				
2017	A5	2673	D1	2983	B6	3462	B1	3857	E7	4421	A2	7910	B6				
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2097	A7	2861	A6	3060	B4	3532	C3	3953	B6	5906	B7						
2101	C1	2862	C7	3061	B4	3541	B3	3954	C6	5909	B7						
2109	D1	2863	E7	3062	B7	3542	C4	3956	C6	5914	B7						
2110	B2	2900	D5	3063	B7	3543	C4	3958	C6	5915	C6						
2204	C2	2901	E7	3068	B7	3545	B4	3959	C6	5916	B7						
2205	C2	2902	E7	3073	A6	3546	C4	3961	B6	5917	B7						
2209	C2	2903	E6	3075	B6	3560	C3	3963	B6	5918	C7						
2210	C2	2904	E6	3077	B6	3562	D4	3964	B6	5919	B6						
2213	C2	2905	E7	3078	D7	3579	C3	3965	C6	5920	C6						
2214	C2	2906	E7	3080	A5	3583	D3	3966	C6	5921	C7						
2215	C2	2907	E6	3081	A5	3584	D3	3967	B6	5922	A6						
2221	C2	2908	E6	3100	B2	3585	D4	3968	C7	5923	B6						
2228	C2	2909	D7	3101	B2	3647	D4	3969	D6	5924	C6						
2302	B2	2910	E6	3102	B2	3648	D4	3970	D6	5925	C7						
2303	B3	2911	D6	3103	C3	3660	D1	3971	D7	5926	A6						
2304	B3	2912	E5	3105	C3	3661	D1	3972	C6	5927	C5						
2305	B2	2913	E6	3106	C2	3686	D1	3973	D7	5930	A6						
2308	C2	2914	E5	3107	C2	3692	A1	3975	D7	5932	A7						
2311	B3	2915	E6	3119	B2	3693	A1	3976	B5	5933	A6						
2312	B2	2916	E5	3120	B2	3694	A1	3977	D6	5934	A6						
2400	A1	2919	A6	3200	C2	3695	A3	3978	C7	5935	A6						
2401	D2	2920	A6	3201	C2	3696	A3	3979	D7	5936	A6						
2406	D2	2921	E5	3202	C2	3697	A3	3980	C5	6001	B7						
2409	A2	2929	A6	3204	C2	3713	A3	3981	C5	6400	A2						
2411	A1	2932	A6	3206	C2	3714	A3	3984	C5	6401	A2						
2414	A1	2933	A6	3209	D3	3715	A3	3987	B5	6402	A2						
2415	A1	2934	A6	3210	D3	3716	A3	3988	C5	6403	A2						

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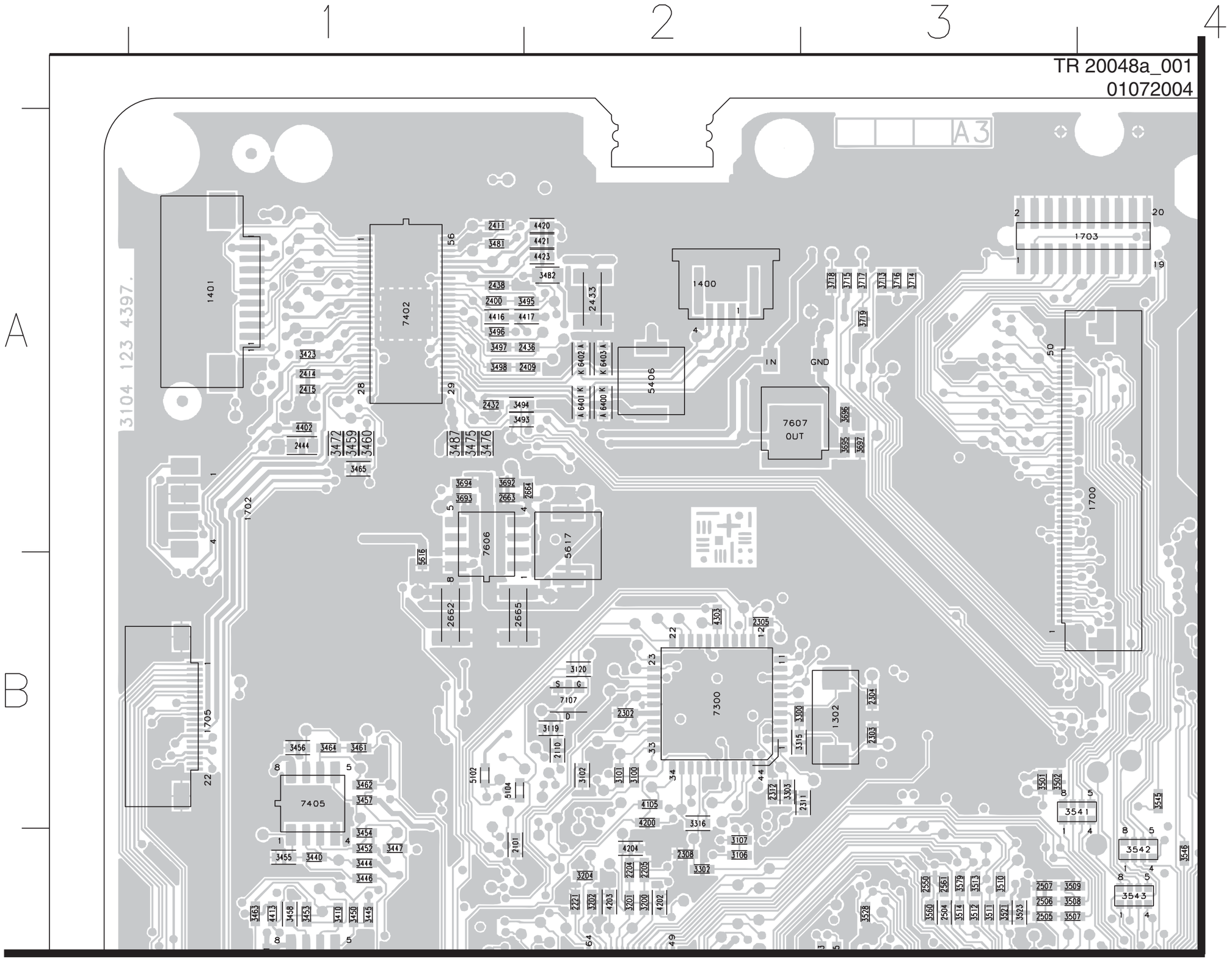
Layout: FEBE Bottom View Part 1



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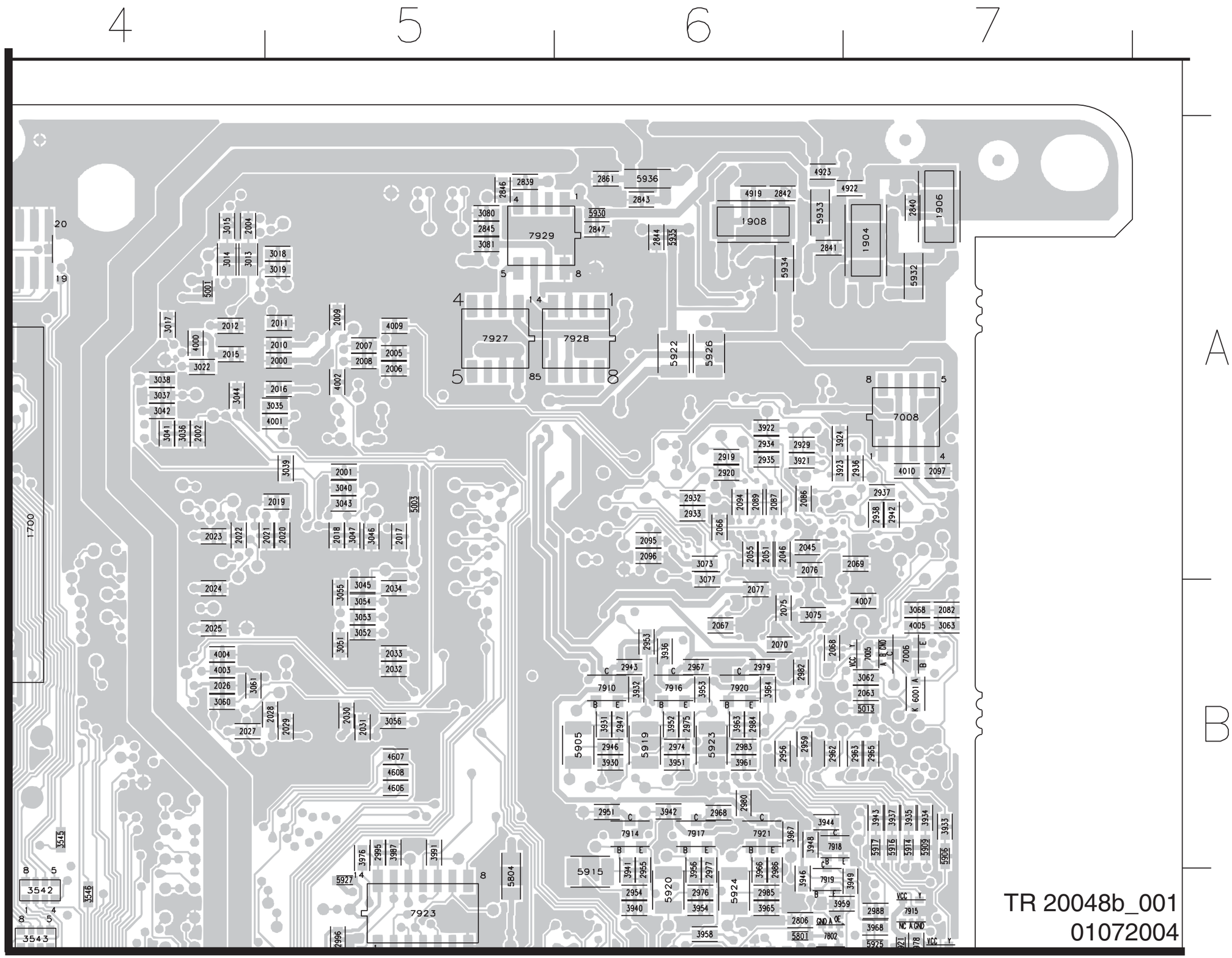
Layout: FEBE Bottom View Part 2



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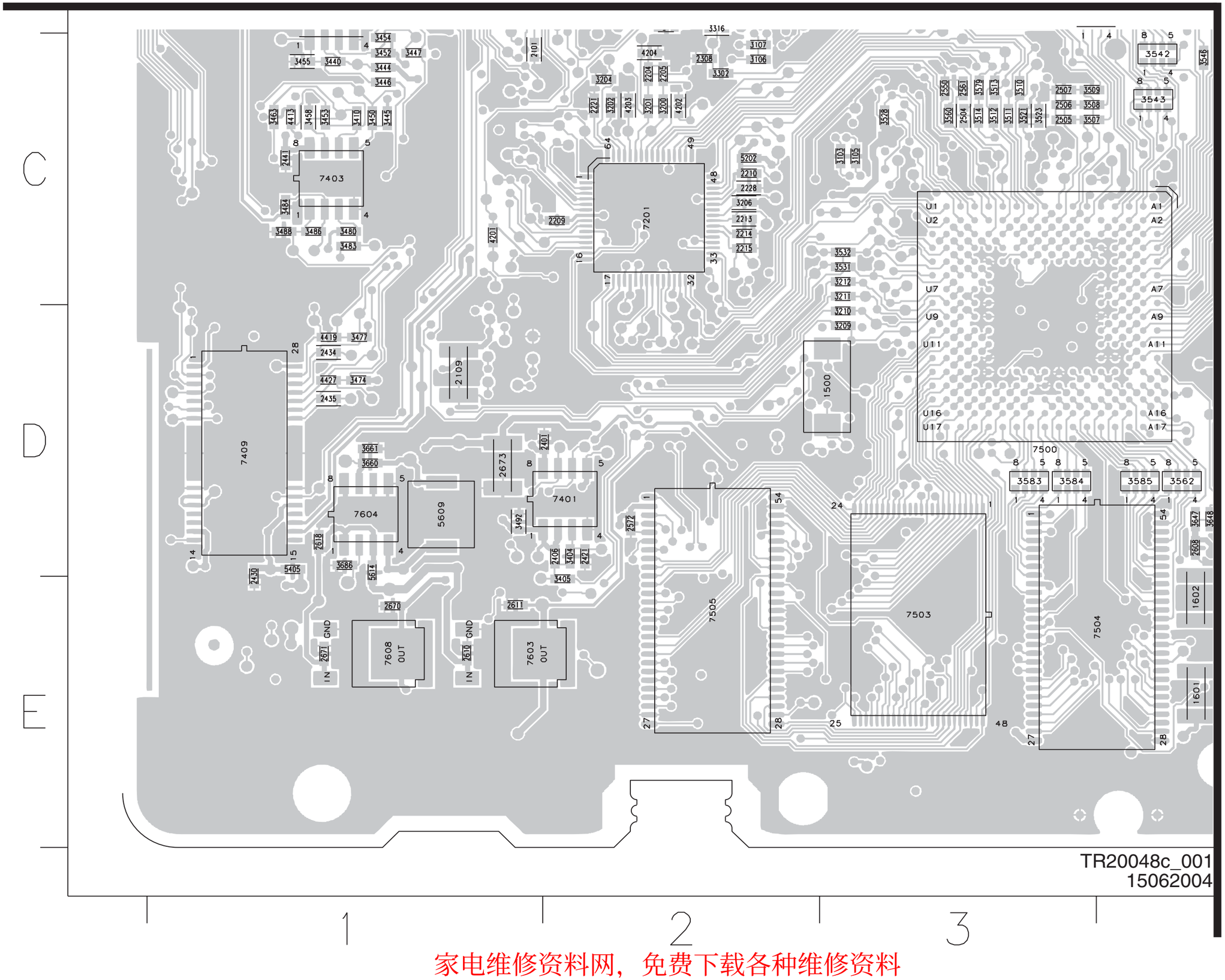
Layout: FEBE Bottom View Part 3



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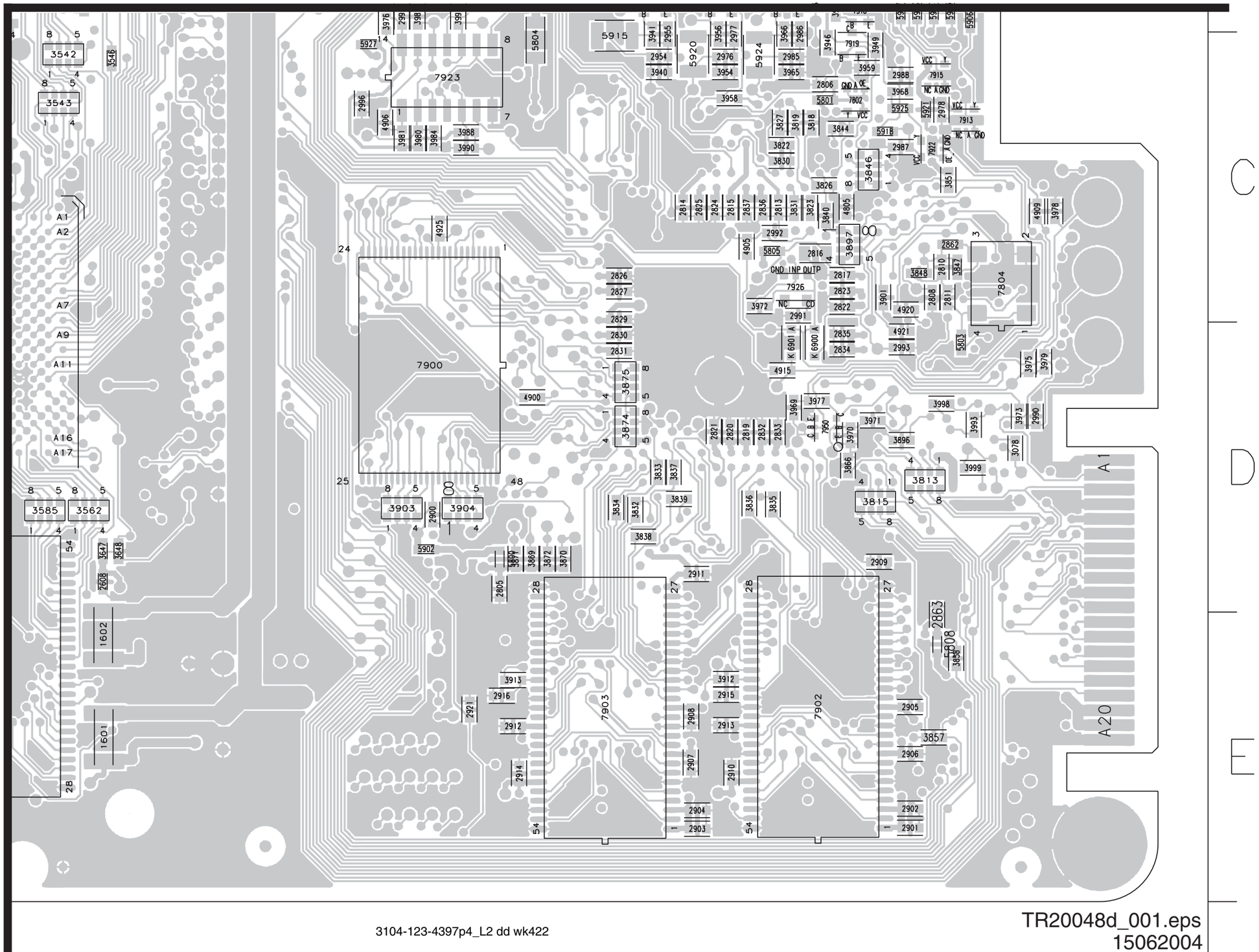
Layout: FEBE Bottom View Part 4



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8. Alignments and Test Procedures

8.1 Reprogramming Procedure of NVM on the FEBE board

The NVM, item 7905, on the FEBE board contains the slash information of the set
The slash version is stored at the end of the production line of the set.
In case of failure, the NVM must be replaced by an empty device. By way of commands via the Diagnostic Software or via ComPair, the factory settings must be restored in the NVM.

8.1.1 Slash Version

The slash version is stored with command 1217 followed by the slash version as parameter.
The slash versions used in DVDR615 are as follows:

- DVDR615/69: 13010

Example:
DD:>1217 13010

8.2 Rework Procedure IEEE Unique Number

8.2.1 Scope:

The procedure describes how to upgrade sets with a unique number after repair. This unique number is stored in the NVRAM (item 7001) of the FEBE board at the end of the production line.
This procedure is only valid or necessary when:

- The FEBE board is replaced
- NVRAM on the FEBE board is replaced
- NVRAM is cleared

In all other cases the repaired set retains its unique number.
The procedure defines several means to re-assure the unique number depending on the possibilities of repair or the state the faulty set is in.

8.2.2 Handling:

State of original (defective) board:

1. The FEBE board starts up in Diagnostics Mode: follow procedure A to retrieve the valid unique number
2. The FEBE board does NOT start up in Diagnostics Mode: follow procedure B.

8.2.3 Procedure A

1. Connect defective digital board to PC via serial cable (3122 785 90017)
2. start up hyper terminal or any other serial terminal via the correct settings (DSW command mode interface)
3. read out existing unique number via 1208
   example:
   DS:> 1208 120800: DvldNumber is: 0x0C22384E5A
   Test OK @
4. note read out
5. program new digital board via nucleus 1207
   example:
   DS:> 1207 1234567890 120700: Test OK @

The set has now the original unique number

8.2.4 Procedure B

1. Note the serial number of the set example:
   VN050136130156
   – VN = production centre (VN....Szekesfehervar). According to UAW-500: V=22 and N=14
   – 05 = change code (this is not used for this calculation)
   – 01 = YEAR
   – 36 = Production WEEK
   – 130156 = Lot and SERIAL number
2. Calculate the unique number: this number always exists out of 10 hexadecimal numbers.
3. First 5 numbers: First we calculate a decimal number according to the formula below:35828*YEAR + 676* WEEK + 26*A + H + 8788 The figures are fixed, YEAR + WEEK + factory code (A + H) are variable Example: 35828*01+676*36+26*1+8+8788 = 68986 (decimal) Then we translate the decimal number to a hexadecimal number. example: 68986 (decimal)= 10D7A (hex)
4. Last 5 numbers: The last 5 numbers exist out of the Lot and SERIAL number.
   We have to translate the decimal number to the next 5 hexadecimal numbers: Example: 130156 (decimal) = 1FC6C (hex)
5. Program new digital board via nucleus 1207. Therefore we use the 10 hexadecimal numbers we calculated above: example:
   DS:>1207 10D7A1FC6C
   120700: Test OK @

The set has now its original unique number

8.3 Alignments after replacing the Boot EEPROM 7904 on the FEBE Board

The NVM, item 7904, on the FEBE Board contains the “Diversity String” that tells the software during startup which hardware version is present.
The setting is stored in the NVM during the production of the FEBE Board.
In case of a fault the NVM must be replaced by a programmed device containing the boot script.
Via the Diagnostic Software the Diversity String is stored with command 1226, followed by the Diversity String as parameter.

The diversity strings used in DVDR615 are as follows:

FEBE Board Type:	String
E1_AV3_4	444248495AB8200145315F4156335F34350 4030000010102000100002004000 0

Example:
DS:> 1226 444248495AB8200145315F4156335F34350
4030000010102000100002004000 0
122600
Test OK @

E2_AV3_4 FEBE Board (for DVDR615/69).

With command 1228 the settings can be displayed.

8.4 Adjust Laser Control

In case of exchanging DVD-M or PWB an adjustment to align OPU and PWB to each other is necessary.

8.4.1 Adjustment Procedure

– Connect the Digital Board to a PC via serial cable (3122 785 90017)
– Start up Hyperterminal or any other terminal program with the correct settings (19200 8-N-1)

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– Power on the set
– Call up nucleus 931 of the DSW. The adjustment takes about 30 seconds

Example:
DS:> 931
93100
Test OK @

– Now data within the OPU EEPROM and the FLASH of the PWB are aligned.

8.5 Drive Test

8.5.1 Short Term Test Procedure

Test 1: Disc LVP 12.01 (7104 099 91851) test layer change on track 28 ->31
Duration: 1 minute

When the LVP12.01 disc is loaded and accepted the next steps are:
– Skip to track 29.
– Press next to chapter 30.
– Fast forward to halfway track 30
– Play track 30 till track 31 halfway
– When this part of the disc is played without any still pictures or freeze frames the beamlanding of the OPU is good (the track transition at the beginning of track 31 gives a short still picture but this is normal.)
– Stop the disc.

Test 2: DVD+R blank disc type Ricoh 4X (7104 099 94261)
Duration: 4 minutes

– Record 1 minute
– Press stop
– Open / close
– Play back recorded track

Remark: When this disc is used for 30 recordings the disc appears to be full. But physically the disc is not full and to use also the remaining space on the disc you can do this by deleting the index pictures.

Test 3: CD-RW low reflection audio disc. (7104 099 96581)
Duration: 1 minute

– Play a few seconds from track 1
– Skip to the last track
– Play a few seconds of the last track.
– Stop the disc

8.5.2 Long Term Test Procedure

Following the steps to be taken for all DVD recorders coming in for service to the workshop related to a DVDM failure and which have “No Defect Found”, NDF after a Short Term Test.
In case no defect is found during the “Short Term Test Procedure” the test has to be extended with a burn in test - “Long Term Test Procedure”.
The burn in test described herein should be done with a DVD+RW disc.
Make a recording of 1 to 2 hours on M1/HQ and M2/SP mode.

Remark:
Attention! To prevent scratches the discs should be treated very carefully!
Heavily scratched discs have a bad influence on the test performance and should be replaced.
The technician has to decide by visual inspection the reliability of his test material.

The pictures below show a bad example of discs used too long.

Figure 8-1

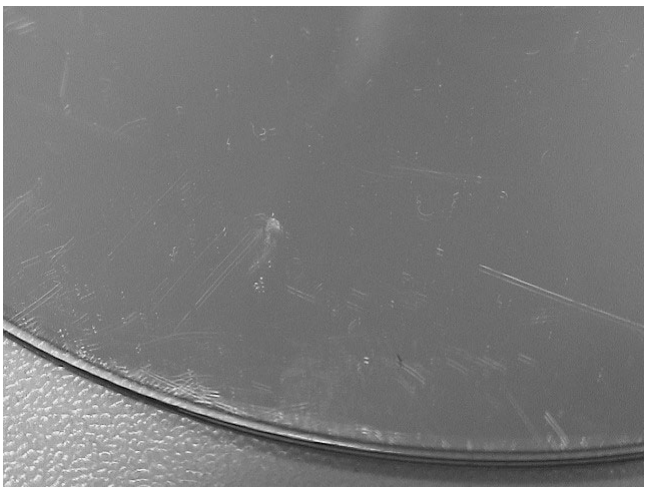

Figure 8-2

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Flowchart for test instruction

In the flowchart below it is described how and when the burn in test has to be carried out.

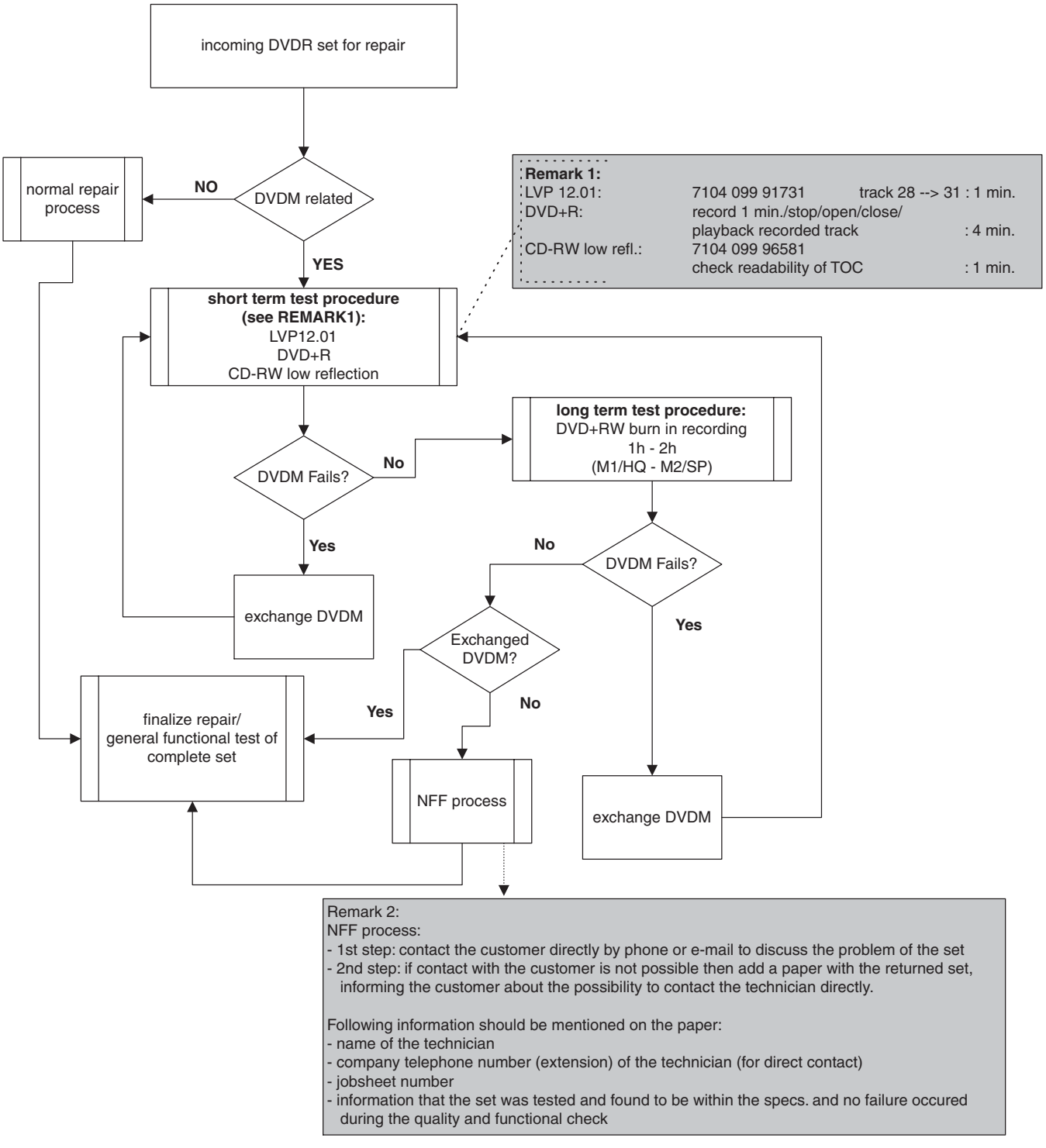
incoming DVDR set for repair
normal repair process
NO
DVDM related
YES
Remark 1:
LVP 12.01: 7104 099 91731 track 28 --> 31 : 1 min.
DVD+R: record 1 min./stop/open/close/ playback recorded track : 4 min.
CD-RW low refl.: 7104 099 96581 check readability of TOC : 1 min.
short term test procedure (see REMARK1):
LVP12.01
DVD+R
CD-RW low reflection
DVDM Fails?
No
long term test procedure:
DVD+RW burn in recording
1h - 2h
(M1/HQ - M2/SP)
Yes
exchange DVDM
No
DVDM Fails?
Yes
Exchanged DVDM?
Yes
No
finalize repair/ general functional test of complete set
NFF process
exchange DVDM
Remark 2:
NFF process:
- 1st step: contact the customer directly by phone or e-mail to discuss the problem of the set
- 2nd step: if contact with the customer is not possible then add a paper with the returned set, informing the customer about the possibility to contact the technician directly.
Following information should be mentioned on the paper:
- name of the technician
- company telephone number (extension) of the technician (for direct contact)
- jobsheet number
- information that the set was tested and found to be within the specs. and no failure occured during the quality and functional check

Figure 8-3

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9. Circuit-, IC descriptions and list of abbreviations

9.1 MOBO (Analog) Board

9.1.1 General

The pcba consists of the following parts:
- Control unit Slave µP
- Power supply unit
- Frontend (Audio & Video)
- Input/Output switching
- Audio ADC & DAC processing
- IR Blaster (for EPG sets only)

9.1.2 Control unit Slave µP

The core element of the MOBO analog board is the slave µP TMP87CM74AF [7107].
It runs on a 5V supply and is responsible for the following functions:
- Interface with the Chrysalis chip on the FEBE Digital backend
- Evaluation of the keyboard matrix on the Front board
- Decoding the remote control commands from the infra-red receiver
- Activation and control of the display
- Heater voltage generation
- Fan control
- IR Blaster (for EPG sets only)

It runs on a high clock frequency of 8MHz with resonator [1101] and a low clock frequency of 32.768kHz with resonator [1102].

9.1.3 Interface to the Chrysalis chip

The communication to the Chrysalis chip on the FEBE Digital backend is done via I^2C interface, where the TMP87CM74AF acts in slave-mode.

9.1.4 Evaluation of the keyboard matrix

A resistor network on the Keyboard (on the Front board) is used to generate a specific direct voltage value (KEY1- & KEY2-line), depending on the pressed key. Via the resistors [3152] and [3154] on the analog/digital (A/D) ports, [7107] pin 32 and 32 the evaluation is done.

9.1.5 IR receiver and signal evaluation

The IR receiver [7200] on the Keyboard (on the Front board) contains a selectively controlled amplifier as well as a photo-diode. The photo-diode changes the received infra red transmission to electrical pulses, which are then amplified and demodulated. On the output of the IR receiver [7200], a pulse sequence with TTL-level, which corresponds to the envelope curve of the received IF remote control command, can be measured. This pulse sequence is fed into the controller for further processing via pin 22 [7107].

9.1.6 Vacuum Fluorescence Display

The VFD BJ900GNK [1100] is fully controlled by the microcontroller. The microcontroller also includes the driving stages. Only two additional drivers [7109] and [7111] are necessary for the grids 8 and 9 because of their large size.

9.1.7 VFD Heater Voltage Generator

The circuit around [7102], [7103] and [7104] is used to generate a proper AC-voltage for the filament of the VFD. For this the microcontroller generates an appropriate rectangular signal with 50% duty-cycle and a frequency of 30kHz at pin 19. [5101] and [2111] are acting as resonance circuit. Via zener-diode [6102] and resistors [3111], [3113] and [3114] the two heater pins of the VFD (FIL1 and FIL2) are clamped so that the grids and segments can be fully switched off.

9.1.8 Fan Control

To avoid unwanted temperatures inside the set (especially the Laser on the OPU of the drive is very sensitive) a fan is located at the rear of the FEBE module. The speed control is dependent on the ambient temperature. A NTC resistor [3211] located on the Keyboard (on the Front board) measures the temperature. The change in temperature is translated into dc levels and send to pin 28 of slave µP [7107]. High / low signals is then sends out via pin 5 and 6 of slave µP [7107] to control transistors [7105] and [7106] which regulates the fan motor to 3 different speeds

9.1.9 Power Supply Unit

Functional principle:
This power supply works in the way of a flyback converter. In the mains input part [1931 to 2314/2315], the mains voltage is rectified and buffered in the capacitor [2314/2315]. From this direct voltage at [2314/2315] energy is transferred into the transformer [5300, pins 7-5] during the conductive phase of the switching transistor [7308] and is stored there as magnetic energy. This energy is passed to the secondary outputs of the power supply in the blocking phase of the switching transistor [7308]. With the switch-on time of the switching transistor [7308], the energy transferred in every cycle is regulated in such a way that the output voltages remain constant regardless of changes in the load or mains voltage. The power transistor is driven by the integrated circuit [7311].

Mains input part:
The mains input part extends from the mains socket [1931] to the capacitor [2314/2315]. The diodes [6302, 6303, 6305 and 6307] rectify the AC supply voltage, which is then buffered by the capacitor [2314/2315]. The common mode coil [5303] and capacitor [2310] work as a filter to block interference arising in the power supply from the mains. Components [1302], [3316] protect the power supply against short-term over voltages in the mains, e.g. caused by indirect lightning.

Start-up with Mains-on:
After connecting the power cord to the mains, the capacitor [2332] is loaded via a current source between pin 8 and pin 1 in the IC [7311]. Once the voltage on [2332] and therefore the supply voltage V_{CC} of the IC [7311] has reached approx. 11V, the IC starts up and provides pulses at its output pin 5. These pulses are used to drive the gate of the power transistor [7308]. The frequency of these pulses is depending on load and mains voltage. The current consumption of the IC is approx. 5 mA at V_{CC} in normal mode.
If V_{CC} drops to below approx. 9V (e.g. with power limitation) or if V_{CC} exceeds approximately 16V (e.g. interruption of the control loop), the output of the IC [7311, pin 5] is blocked and a new start-up cycle begins.
(See also Overload, Power Limitation and Burst Mode section)

Normal operation:
With the power supply in normal mode, the periodic sequences in the circuit are divided primarily into the conductive and blocking phase of the switching transistor [7308]. During the **conductive phase** of the switching transistor [7308], current flows from the rectified mains voltage at capacitor [2314/2315] through the primary coil of the transformer [5300, pins 7-5], the transistor [7308] and resistors [3330, 3331] to ground. The

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positive voltage on pin 7 of the transformer [5300] can be assumed as constant for a switching cycle. The current in the primary coil of the transformer [5300] increases linearly. A magnetic field representing a certain value of the primary current is formed inside the transformer. In this phase, the voltages on the secondary coils are polarized such that the diodes [6300, 6301, 6304, 6306, 6309, 6311, 6315 and 6318] block. From the controller [7319] a current is supplied into the CTRL input on the IC [pin 3, 7311] via optocoupler [7316]. Once the switch on time of the switching transistor [7308] - that corresponds to the current supplied into the CTRL input - has been reached, the switching transistor [7308] is switched off. When the switching transistor has been switched off, the **blocking phase** begins. No more energy will be transferred into the transformer. The inductivity of the transformer will still attempt to keep the current flowing at a constant level (U=L*di/dt). Switching off transistor [7308] interrupts the primary current circuit. The polarity of the voltages on the transformer is reversed, which means that the diodes [6300, 6301, 6304, 6306, 6309, 6311, 6315 and 6318] become conductive and current flows into the capacitors [2302, 2308, 2316, 2322, 2325 and 2329] and the load. This current is also ramp-shaped (di/dt negative, therefore decreasing).
The **feedback control** for the switched-mode power supply is done by changing the conductive phase of the switching transistor so that either more or less energy is transferred from the rectified mains voltage at [2314/2315] into the transformer. The regulation information is provided by voltage reference [7319]. This element compares the 5V-output voltage via voltage divider [3360, 3363, 3364] with an internal 2.5V reference voltage. The output voltage of [7319] passes via an optocoupler [7316] for insulation of primary and secondary parts as a current value into pin 3 on the IC [7311]. The switch-on time of the transistor [7308] is inversely proportional to the value of this current.

Overload, power limitation, burst mode:
With increasing load on one or more of the power supply outputs, the switch-on time for the power transistor [7308] increases, and thus also the peak value of the delta-shaped current through this power transistor. The equivalent voltage of this current profile is passed from resistors [3330] and [3331] via [3335] to pin 5 of the IC [7311]. If the voltage on pin 2 reaches approx. 0.4V in one switching cycle, the conductive phase of the switching transistor is ended immediately. The check is done in each individual switching cycle. This process ensures that no more than approx. 50W can be taken out from the mains (= **power limitation**).
If the power supply reaches the power limit, the output voltages and the supply voltage V_{CC} on pin 1 of the IC [7311] will be reduced following further loading. If V_{CC} is less than approx. 9V at any point during this process, the output of the IC [7311, pin 6] is blocked. All output voltages and V_{CC} decrease and a new start-up cycle begins. If the overload status or short-circuit remains, the power limitation will be activated immediately and the voltages will again decrease, followed by another start-up cycle (**Burst Mode**). The amount of power taken up from the mains in burst mode is low.

Standby modes:
In the AV-Standby operating mode of the set, the DD_ON control line is low switching off the +5VE and +12VE supply [connector 1932] to the FEBE Frontend and DVD drive. This reduces the amount of power taken from the mains.
In Low Power Standby mode, additional STBY control line is high switching off the 12V, 5V, 5N and 3V3SW supply. In this mode all functions are switch off and the slave µP (in idle mode) and real time clock (32.768kHz) is running. This reduces power consumption to less than 3W. In some program mode the slave µP provides a wakeup service (STBY-line switches to low), then the Chrysalis main controller starts up and asks for the wakeup reason.

9.1.10 Tuner Frontend

The MOBO board supports 3 possible Tuner Frontend unit namely:
* 1700 - PAL BG, DK and I Broadcast System
* 1701 - NTSC-M Broadcast System
* 1702 - not in used

It has a RF IN for antenna connection and RF OUT which provides a RF loop through during Standby mode for connection to the TV.
The Frontend [1701] (Tuner & IF-demodulator) is controlled by the I2C (SCL_5V- and SDA_5V-) lines coming from the slave µP.
Complete video processing is done in this unit and the video output (CVBS) is taken out from the [VID_OUT] pin via transistor 7700 as VFV-line to the Video I/O circuitry.
The audio-IF component SIF1 is taken out from the [SIF_OUT] pin for demodulation in the sound processor [7600].
A modulator is also included in this unit. The audio- and video-signal to the modulator are the ones from the selected input or the playback path of the set (AMCO- and D_CVBS-line). Via the MSW-signal and [7701] the modulator is switched on and off. In opposite to this the antenna loop-through is opened or closed. The CSW-line switches the modulator between CH3 or CH4.
To achieve optimal tuning the AFC-line is detected by the slave µP via an analog input.

Audio demodulator
The sound demodulation is done by the MSP3425 [7600], which is also fully controlled via I^2C-bus by the slave µP (determination of bandwidth, amplitude, standard, ...). The audio signals are available at pin 30 and pin 31 of [7600] and fed as AFER- & AFEL-line to the audio-I/O for further processing.

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9.1.11 Audio routing

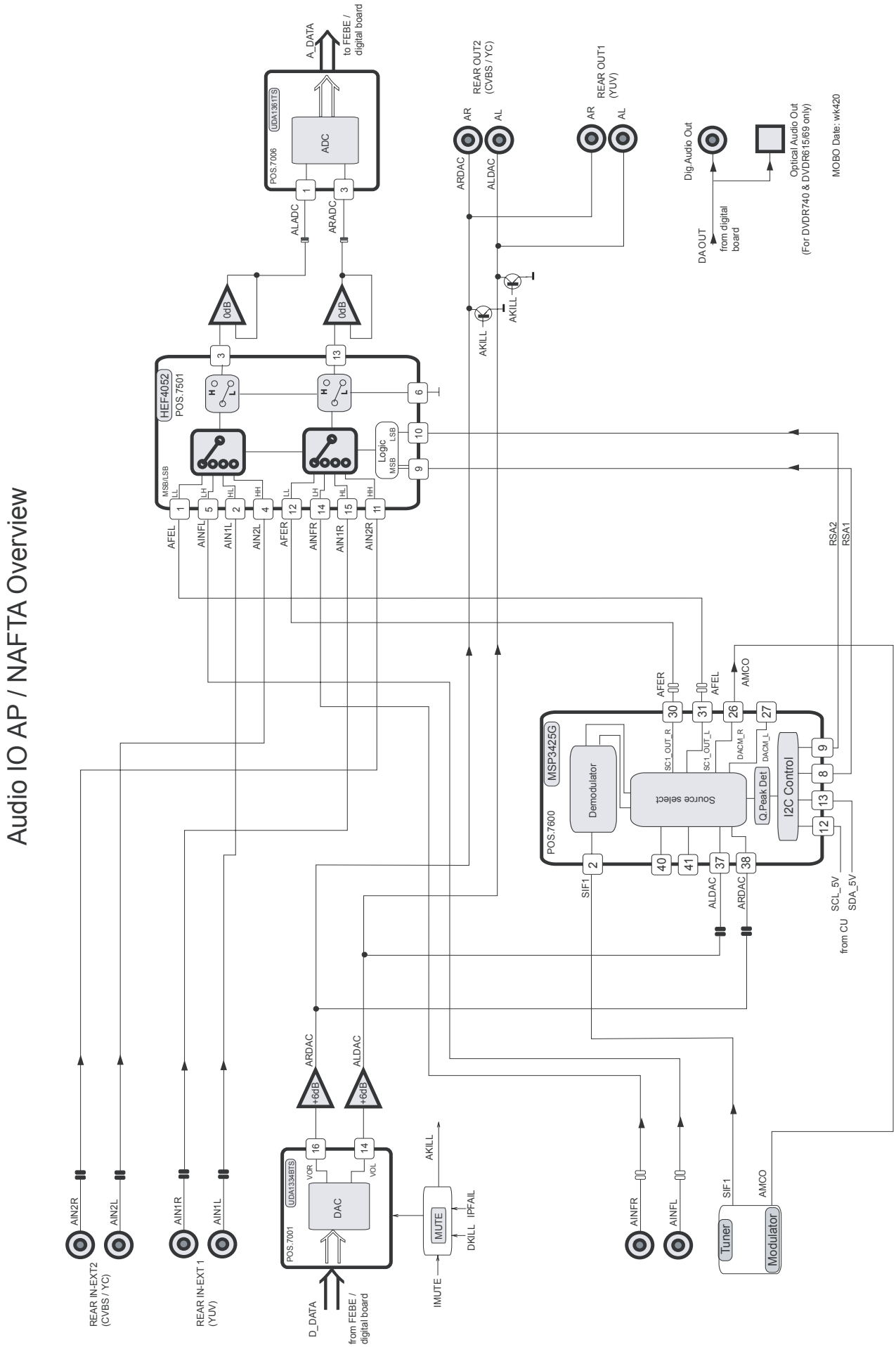

Figure 9-1 MOBO Audio IO AP / NAFTA

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The sound processing is always done in stereo (that means separate left- and right-channel).

a) Record path:
The complete selection of audio signal for recording is done by a HEF4052 [7501], which is a dual four-to-one multiplexer. The input lines for the selector [7501] are coming either from MSP [7600] (AFEL / AFER) or cinch rear-in Ext 1 (AIN1L / AIN1R) or cinch rear-in Ext 2 (AIN2L / AIN2R) or the cinch front-in (AINFL / AINFR). The [7501] is controlled via RSA1- and RSA2-signals coming from the MSP [7600]. The MSP acts as a port expander of the slave µP. The Op-Amp on the output [7500] is necessary for performance reasons and acts also as a driver. The selected signals ALADC and ARADC are directly fed to the Audio-ADC.
As there is also a fifth input (DV-in), the corresponding audio signals ALDAC / ARDAC) from the FEBE board are routed via the MSP [7600] and output as AFEL / AFER to selector 7501

b) Line-out path:
See chapter 9.1.12

c) Digital audio-out path:
In addition to the analog output the set is also equipped with a digital audio output via cinch plug [1955]. The signal is generated on the FEBE board and routed via the audio interface cable and connector [1900] to the MOBO (Analog) board. Here the DAOUT-line first passes a 6-fold inverter [7551] being used as a driver and for performance reasons (noise reduction, jitter, etc.). Afterwards a transformer [5551] is necessary to achieve the correct level and also to have a floating output with isolated ground before the signal is fed via [3559 & 3563] to cinch plug [1955]. The capacitor [2553] performs an AC-coupling between connector- and set-ground.

9.1.12 Audio ADC/DAC

The conversion of analog audio signals from the record-selector [7501] in the I/O (ALADC- & ARADC-) is done via UDA1361TS [7006]. This IC can process input signals up to 2Vrms by using external resistors [3029, 3030] in series to the input pins. All required clock signals are generated on the FEBE board and only the audio data (A_DAT-line) are routed from MOBO (Analog) to FEBE board for further processing.
The transformation of digital audio back into the analog domain is done by UDA1334BTS [7001]. All necessary clock signals are coming from the FEBE board and digital audio data (D_DATA0-line) are converted into analog signals, which are available at pins 14 and 16 of [7001]. Afterwards an Op-Amplifier [7003] (line driver & level adaptation, gain = 2), which also works as low-pass filter to increase signal performance (noise, distortions,), is passed. Then both signals (ALDAC & ARDAC) are directly routed to the rear cinch output. The DAC has also a mute possibility, which can be activated by setting pin 8 to 3.3V via [7002]. This mute is controlled either by the FEBE board (D_KILL-line) or IMUTE from the slave µP or the IPFAIL-signal from the Power Supply Unit.
The signals from the audio DAC part (ARDAC/ALDAC) are directly routed to both cinch rear outputs, which are connected in parallel. To avoid plops and any other audible noise on the output there is a mute-stage implemented [7503 & 7504] for each channel. The activation is done via AKILL-line, which is a combination of the KILL from the IMUTE from slave µP, D_KILL from FEBE board, DAC_MUTE from DAC-part and IPFAIL from the Power supply unit.

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9.1.13 Video-routing

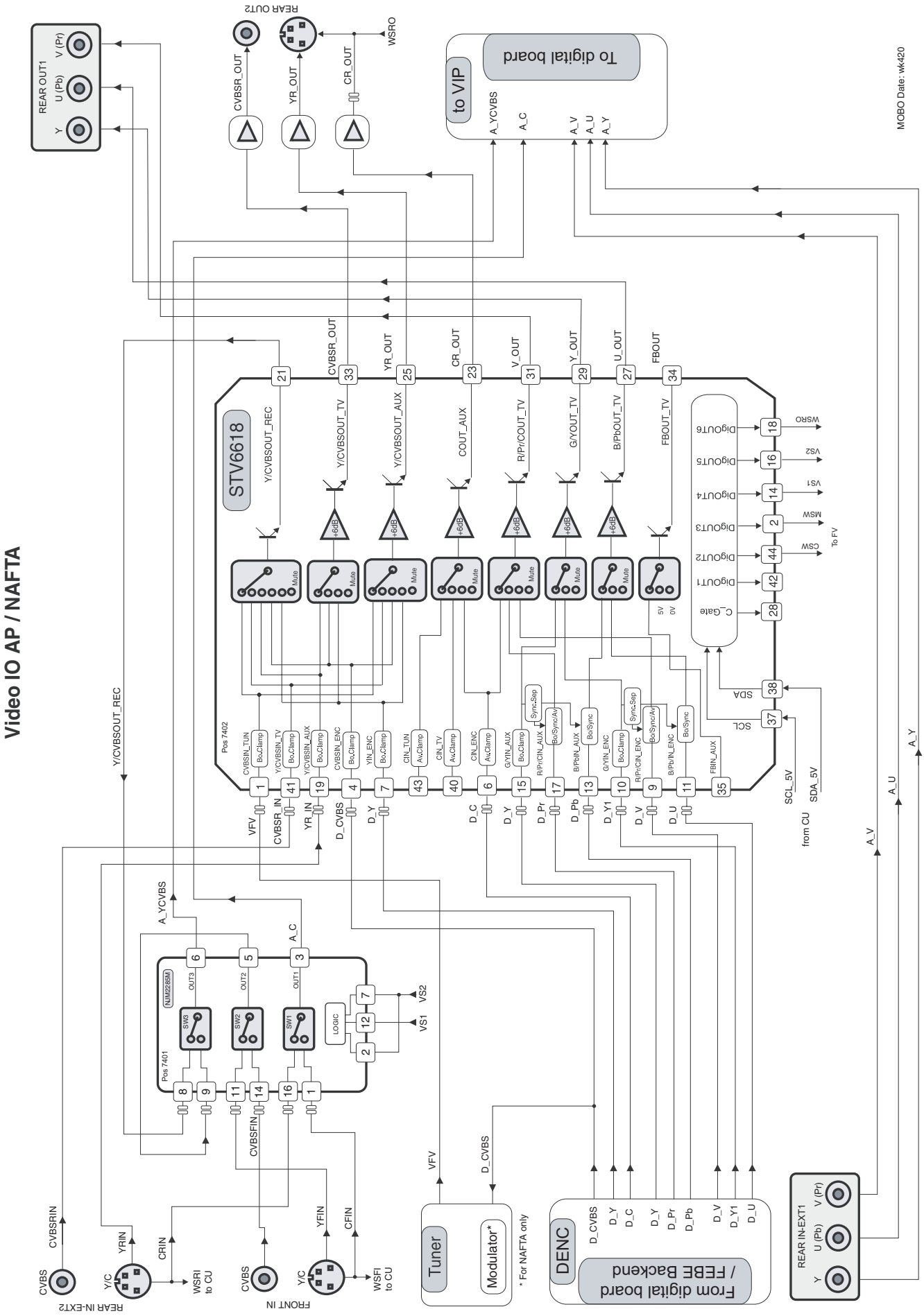

Figure 9-2 MOBO Video IO AP / NAFTA

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A matrix switch STV6618 [7402] controlled by the slave µP via I2C-bus is used for Video I/O switching. All used outputs excluding pin 21 (Y/CVBS-REC) have a 6dB-amplification and a 75 ohms-driver-stage inside. This IC also includes several digital outputs, which are used for switching purposes on the MOBO (analog) board.
The record selector inside the switch selects between the inputs from Tuner Frontend (VFV), CVBS Rear Ext 2 (CVBSR_IN) or S-Video Rear Ext 2 (YR_IN). Afterwards the signal passes another switch [7401] in which a selection between signals (CVBSFIN or YFIN) from the front or the pre-selected one is done. Likewise another switch selects between Rear Ext 2 (CRIN) or Front in (CFIN). The output signals of [7401] are fed as A_YCVBS- and A_C-line to the FEBE board for further processing.
To reduce the number of external presets there is only one station for CVBS or Y/C (front and rear). The set automatically detects between the two inputs depending on the presence of a video signal where Y/C has higher priority.
The signals D_C and D_Y are fed through [7402] (6dB amplification) and via [7400] and [7403] as driver to the S-Video output connector.
The D_CVBS signal is fed directly to the modulator of the Tuner Frontend and [7402] (6dB amplification) and via [7404] as driver to the CVBS output connector.
The Y/U/V signals from the FEBE board are also passing [7402] for 6dB amplification and driving purposes.
The detection of the picture ratio information on the Y/C inputs (Rear or Front) is done by measuring the DC-level on the Chroma signal via an analog input of the slave µP (WSRI- and WSFI-line). In case the level is higher than 3.5V the input signal is a 16:9 source, if the level is lower than 2.4V the picture ratio is 4:3
For generation of the appropriate DC-voltage on the Y/C output the WSRO-line is controlled via pin 18 of [7402] by the slave µP (pin 18 set to low means 4:3, pin 18 set to high determines 16:9).
During Standby there is no loop-through of any input to any output performed.

9.2 VAU8041 (FEBE / AV3.5) Module

9.2.1 General

The Video Recorder Drive VAU8041 module known as FEBE 1.0 with AV3.5 drive is actually the Video Recorder Drive VAD8041 module with and extended board. The new FEBE board contains both the frontend Servo and backend Digital portion. Being physically on the same board the IDE connector is no longer required.
The recorder engine performs all basic servo tasks - reading and writing data on the disc and controls all functions like tray control, start/stop the disc, tracking, jumping and communicating to the host.
Mechanically, the module consists of a motorized tray loader that contains the dual laser optical pickup unit and a board that contains all the electronics needed to control the drive and interfacing to the MPEG encoder/decoder backend Digital portion
The backend Digital portion encodes and multiplexes analogue video and digital uncompressed audio (I^2S) into an MPEG2 stream. This MPEG2 stream is formatted, to be recorded by the DVD+RW/+R engine. In playback, it decodes the MPEG2 stream into analogue and digital audio and into analogue video.
There is a temperature sensor included in the drive that prevents malfunction or destruction of the drive in case the temperature inside the drive gets too high.

9.2.2 Power Supply

The +3V3, +5V, -5V and +12V come from the PSU of the MOBO analog board via connector [1905] while the +1V8 core voltage is generated on the board by a low voltage buck controller [7929]. It provides the control for DC-DC power solution producing a +1.8V output power over a wide current range. The NCP1570-based solution is powered from +12V with the output derived from the +3V3 supply. It contains all required circuitry for a synchronous NFET [7927-1] and [7928-2] buck regulator.

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9.2.3 Frontend part

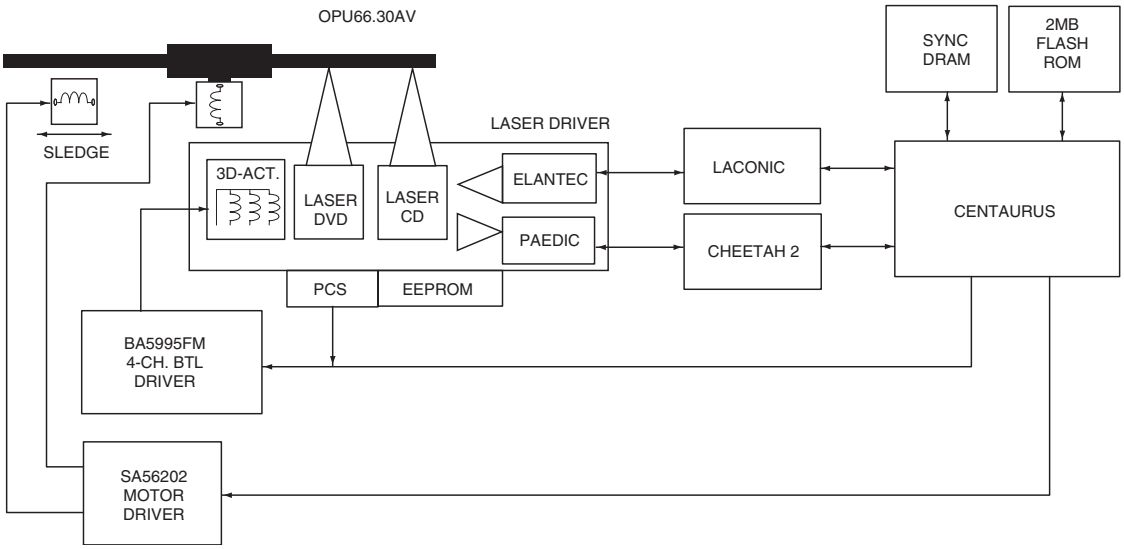

Figure 9-3 Servo Block

This section describes briefly the functional behavior of the engine. It performs all basic servo and data processing function:

- it reads data from the disc
- it writes data to the disc - it controls all other functions like tray control, start/stop the disc, tracking, jumping, and communication to the host.
- encodes and multiplexes analogue video and digital uncompressed audio (I^2C) into a MPEG2 stream
- decodes the MPEG2 stream into analogue and digital audio and into analogue video

Centaurus 1.5 (PNX7850E)

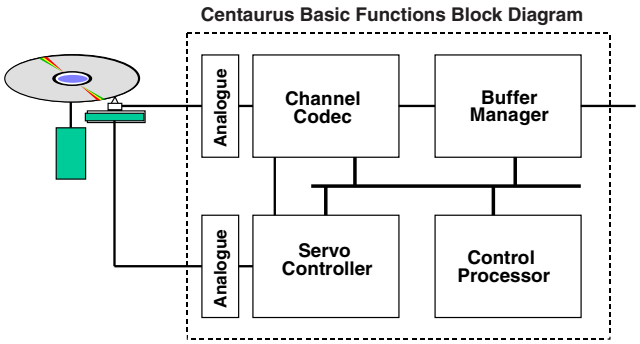

Figure 9-4 Centaurus

The Centaurus [7500] is a highly integrated IC that controls all the functions of the drive. It interfaces via the IDE bus to the MPEG backend and incorporates the following functions.

- CD/DVD channel decoder/encoder
- CD/DVD data block decoder/encoder
- Buffer Manager
- Digital Servo processor using digital signal processor
- Drive system microprocessor based on MIPS core

The MIPS microcontroller uses Flash ROM for the firmware and SRAM to execute the program. SDRAM is provided for the encoding/decoding function block of centaurus [7500]. 2 Mbytes of data buffer size is available inside the IC for data storage.

Cheetah 2 (TZA1047)

The Cheetah2, [7201] is an analogue pre-processing for the diode signals coming from the OPU. It contains an amplifier with programmable gain that amplifies the RF signal to adapt the output for the different reflectivity of the various discs. The tracking signals are filtered and normalized. In addition the IC contains a timing circuit for the sample and holding circuits and for switching the various blocks between read and write. Supporting functions such as laser control and offset control are incorporated. Communication to and from the IC is based on a fast two-wire serial bus that works according to the I^2C interface protocol.

Laconic (TZA1042)

The main function of the Laconic, [7300] is to control the laser power. The IC forms a closed control loop in combination with the Elantec located on the OPU. It compensates aging and temperature of the laser. Furthermore it forms a fingerprint correction loop. It also acts as bridge between I^2C and serial bus of the Elantec laser driver on the CPU.

Optical Pick-up Unit

The OPU66 is a dual laser Optical Pick-up Unit for the DVD+RW/+R. It consists of a 3-D actuator for focusing, radial tracking and tilt correction.

- 650nm laser for DVD
- 780nm laser for CD

On the interconnecting flex several electrical components are mounted.

- Elantec: programmable laser diode power driver
- Paedic: integrated photo detector with programmable gain pre-amplifier
- Eeprom: containing a number of values representing adjustments belonging to the OPU

The laser control and diode signal processor ICs together with an Eeprom are mounted on the OPU flex.
The laser control IC generates the DVD laser read and writing signals needed for reading DVD discs and writing DVD+RW/+R discs (write strategies of DVD+RW/+R discs).
The diode signal processor is an analogue pre-processor adapted for the CD and CD-R/RW read function.
The Eeprom contains information about writing current, writing strategies and other parameters belonging to the OPU.

Motor and Servo drivers

The disc, tray and sledge motors are driven by a one-chip motor driver SA56202 [7402] while the 3-D actuator is driven & control by a 4-channe BTL driver BA5995FM [7409] and some low power Ops amplifier LM358D [7401], [7403] and [7405].

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9.2.4 Backend Digital part

Record Mode

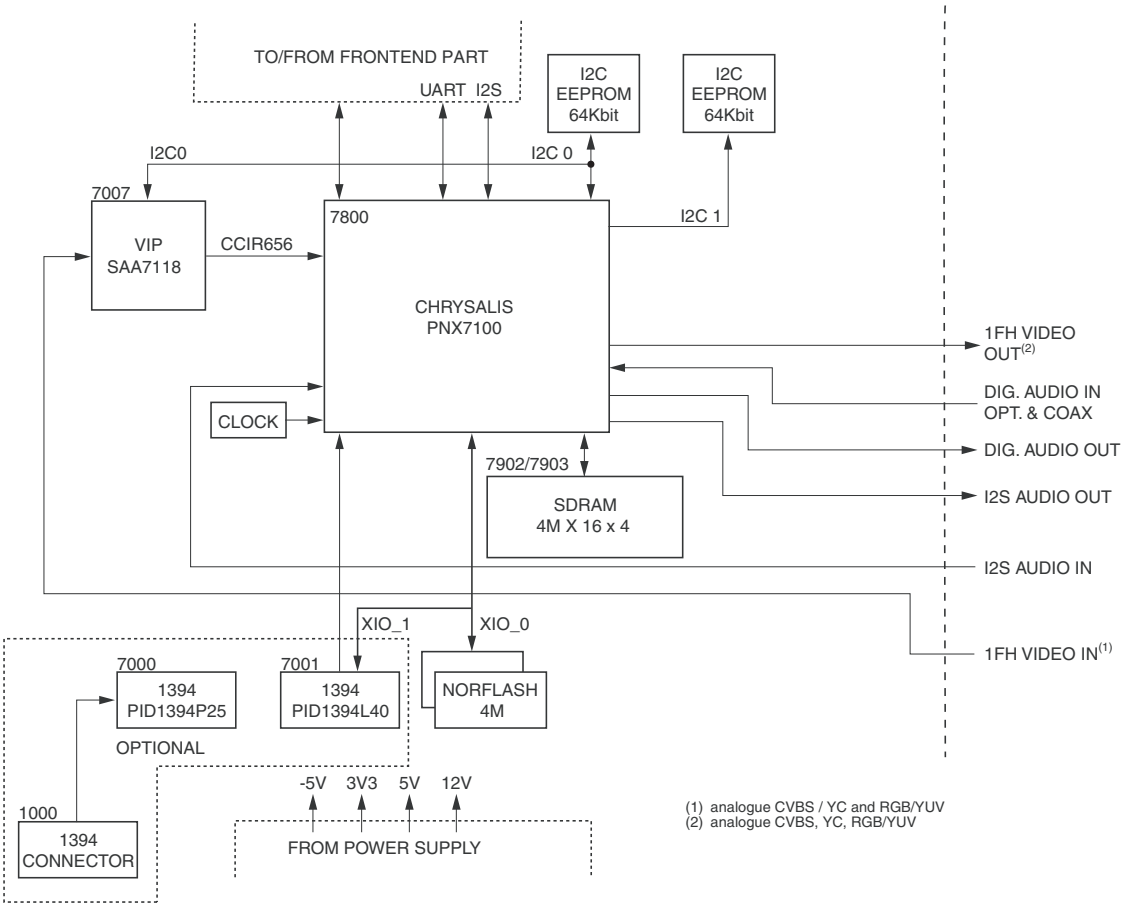

Figure 9-5 Chrysalis Block

Video Part

The analogue video input signals CVBS, YC and YUV/RGB (RGB for Euro and YUV for USA) from the MOBO analog board are routed from connector [1901] to IC [7007] SAA7118 , Video Input Processor.
The digital video input signals are routed from the DV-in connector [1000] via ICs [7000], 1394 PHY and [7001] 1394 LINK to Chrysalis PNX7100 [7800].
The multi-standard Video Input Processor VIP, [7007] encodes the analogue video to digital stream (CCIR656 format). It provides filtering of the analogue signals and separation of luminance and chrominance by a comb filter. The output stream, named ITU_IN(7:0), is then routed to the Chrysalis [7800]. This IC encodes and decodes the digital video stream into/from MPEG2 format.

Audio Part

I^2S audio is sent from the MOBO analog board to the Chrysalis [7800] via connector [1902]. The Chrysalis [7800] compresses the I^2S audio data into an MPEG1-L2/AC3 audio stream.

Front-end I^2S

Chrysalis [7800] interfaces directly with the Centaurus [7500] and buffers the in- and out-going data streams.
In the Chrysalis [7800], the video MPEG2 stream and the audio AC3 stream are multiplexed into an I^2S stream. The serial data are sent to the Centaurus [7500] for recording.

Playback Mode

During playback, the serial data from the Centaurus [7500] is going directly to the Chrysalis [7800] via the serial front-end I^2S interface. The Chrysalis [7800] is an MPEG CoDec and has the following outputs:

- To the MOBO analog board: analogue video RGB, YC, CVBS on connector [1901].
- I^2S audio (PCM format) on connector [1902].
- SPDIF audio (digital audio output) on connector [1902].
- Communication gateway (RS232) on connector [1907].

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Clock Distribution

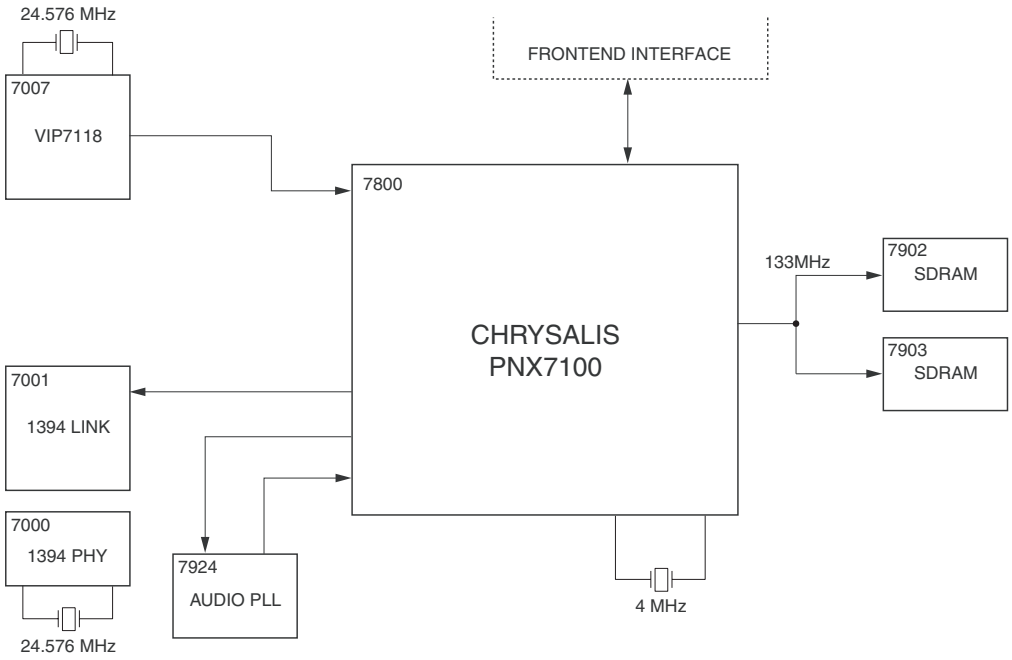

Figure 9-6 Chrysalis Clock

The Chrysalis [7800] has a complex clock system, which is needed to support the processes running at different frequencies such as video decoding, audio decoding or peripheral I/O devices etc. To ensure a synchronous initialization of all the registers and state machines, all the PLLs are switched to their default frequency and the reset sequence is run at 4MHz. Then when the booting control unit is correctly initialized and once it has captured all the booting parameters, it sets the PLLs to its functional frequency to allow the modules to run at their nominal frequencies. Thanks to a clock blocking mechanism, the frequency switching is glitch free.

System clocks:

- PNX7100 [7800], pins AF9 and AF10 : 4MHz provided by the crystal oscillator [7804]
- SAA7118 [7007], pins A3 and B4 : 24.576 MHz provided by crystal [1002]
- SDRAM [7902] and [7903], pin 38 : 133MHz provided by PNX7100
- 1394-LINK [7001], pin 88 : 49.152MHz provided by 1394-PHY
- 1394-PHY [7000], pin 59 and 60 : 24.576MHz provided by crystal [1001]

Memory

Several memories are used on the Chrysalis [7800]:

- EEPROM [7904] : this memory contains all the necessary boot parameters of the board
- EEPROM [7905] : this memory contains all the necessary parameters for the application
- FLASH [7900] : this memory contains the application, diagnosis and service software

Reset

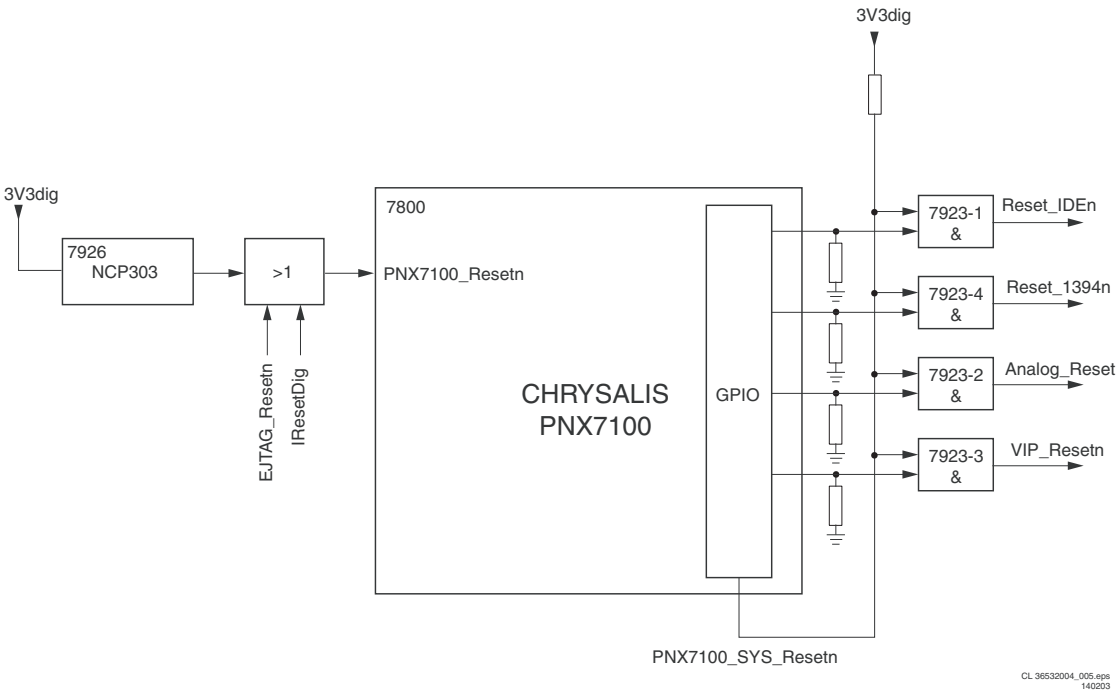

Figure 9-7 Chrysalis reset

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The voltage detector NCP303LSN290 [7926] provides the reset signal PNX7100_RESETn (active: low) with the correct timing behavior. This circuitry functions as a Power-On Reset (POR) module, which detects the minimum functional voltage that is needed by the device. It also detects any voltages drop. When the power voltage is outside the nominal range, a reset signal is generated by the POR module and fed to the reset module which controls the individual reset of the different peripherals and processing units.
There are two control lines which can overrule this reset signal:

- IRESET_DIG (controlled by the slave µP on the MOBO Analog board)
- EJTAG_RESETn (only for production)

They can pull the output of the NCP303LSN29 [7926] down via a shottky diode.
So when the output signal PNX7100_RESETn is low, the board will reset. When this signal is high, the board is up and running.
The PNX7100_SYS_RESETn is a general enabling signal for the different reset lines. All other reset lines are directly driven from Chrysalis [7800] port pins (eg. MPIO13_IDE1_RESETn). All reset lines are logically connected via 74LVC08AD [7923] AND-gates. If both reset signals are low, all other external devices are initialized.

I^2C Bus

The Chrysalis [7800] is the master of all the I^2C bus (during reset, external I^2C masters are allowed). The following ICs are controlled by the I^2C bus:

- [7904] Boot Eeprom
- [7905] NVRAMs
- [7007] VIP

9.2.5 I/O Connectors

Audio IO Connector [1902]

The Audio In/Out (AIO) connector is used to interchange digital audio signals between MOBO Analog and FEBE Backend Digital portion.

Video IO Connector [1901]

The Video In/Out (VIO) connector is used to interchange analogue video signals between MOBO Analog and FEBE Backend Digital portion.

9.2.6 Service UART Interface

Transistor 7950, BC847BS is used to make a level conversion from microprocessor (LVTTL) to +/-5V (compatible with most RS232 interfaces) and vice versa. The control line MPIO19_CTL_SERVICE is used to activate service and diagnostic SW at start up procedure. The connectivity is provided via an external service tool.

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9.3 IC Descriptions

9.3.1 MOBO Board

IC7001: UDA1334BTS MOBO Board, Digital to Analoque Converter

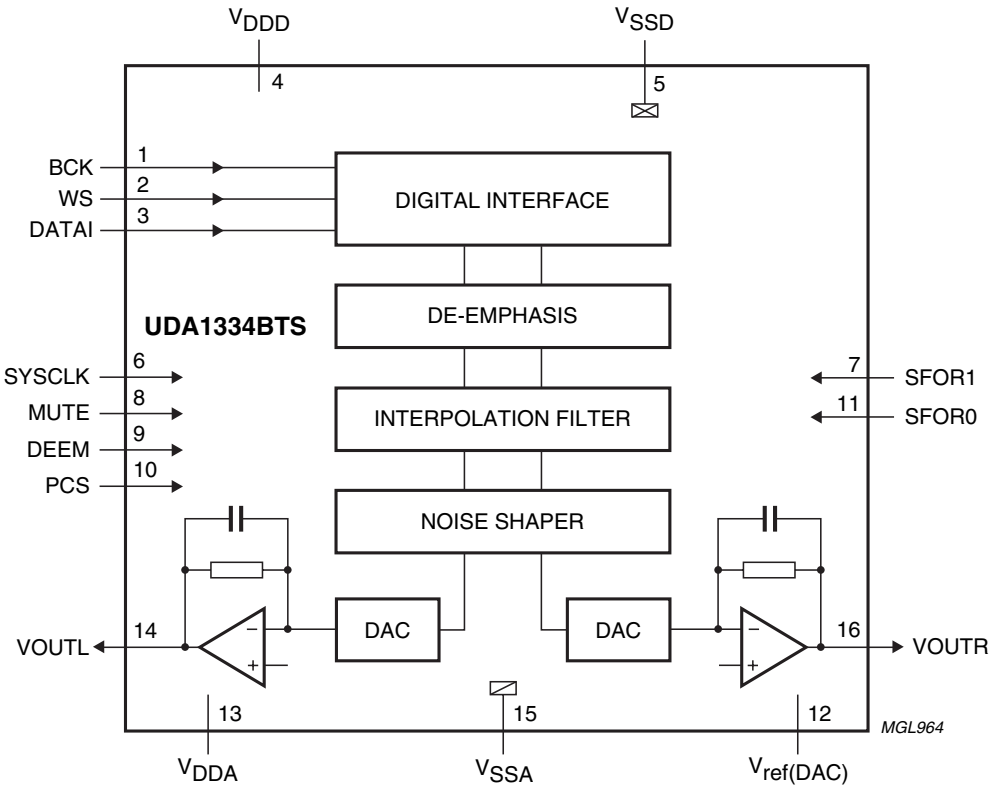

Figure 9-8

SYMBOL	PIN	PAD TYPE	DESCRIPTION
BCK	1	5 V tolerant digital input pad; note 1	bit clock input
WS	2	5 V tolerant digital input pad; note 1	word select input
DATAI	3	5 V tolerant digital input pad; note 1	serial data input
V_{DDD}	4	digital supply pad	digital supply voltage
V_{SSD}	5	digital ground pad	digital ground
SYSCLK	6	5 V tolerant digital input pad; note 1	system clock input
SFOR1	7	5 V tolerant digital input pad; note 1	serial format select 1
MUTE	8	5 V tolerant digital input pad; note 1	mute control
DEEM	9	5 V tolerant digital input pad; note 1	de-emphasis control
PCS	10	3-level input pad; note 2	power control and sampling frequency select
SFOR0	11	digital input pad; note 2	serial format select 0
$V_{ref(DAC)}$	12	analog pad	DAC reference voltage
V_{DDA}	13	analog supply pad	DAC analog supply voltage
VOUTL	14	analog output pad	DAC output left
V_{SSA}	15	analog ground pad	DAC analog ground
VOUTR	16	analog output pad	DAC output right

Figure 9-9

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IC7006: UDA1361TS MOBO Board, Analoque to Digital Converter

BLOCK DIAGRAM

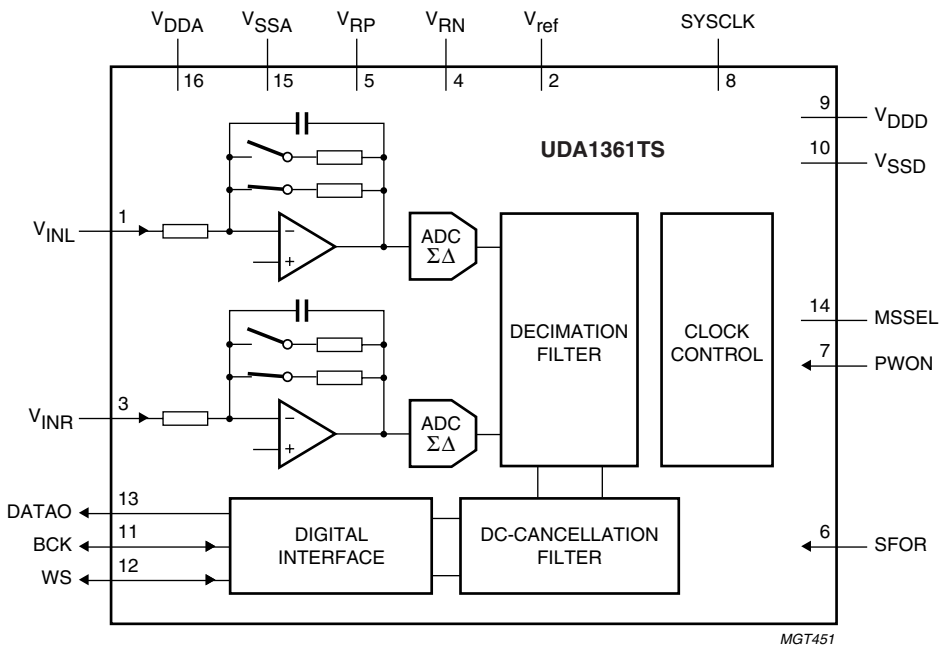

Fig.1 Block diagram.

PINNING

SYMBOL	PIN	DESCRIPTION
V_{INL}	1	left channel input
V_{ref}	2	reference voltage
V_{INR}	3	right channel input
V_{RN}	4	negative reference voltage
V_{RP}	5	positive reference voltage
SFOR	6	data format selection input
PWON	7	power control input
SYSCLK	8	system clock 256, 384, 512 or 768f_s
V_{DDD}	9	digital supply voltage
V_{SSD}	10	digital ground
BCK	11	bit clock input/output
WS	12	word select input/output
DATAO	13	data output
MSSEL	14	master/slave select
V_{SSA}	15	analog ground
V_{DDA}	16	analog supply voltage

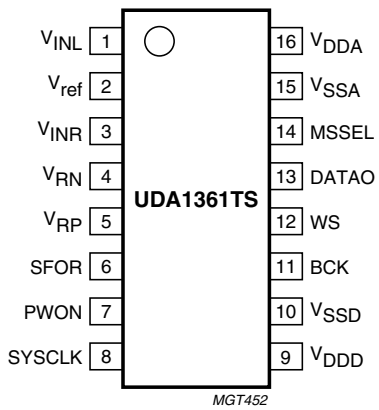

Fig.2 Pin configuration.

Figure 9-10

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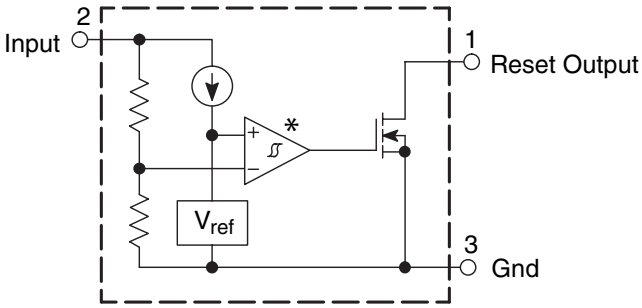
IC7100 NCP301LSNxx MOBO Board, Reset Circuit

NCP301xSNxxT1
Open Drain Output Configuration



* The representative block diagrams depict active low reset output 'L' suffix devices. The comparator inputs are interchanged for the active high output 'H' suffix devices.

This device contains 25 active transistors.

Figure 1. Representative Block Diagrams

Figure 9-11

IC7107 TMP87CM74AF MOBO Board, Microprocessor

Block Diagram

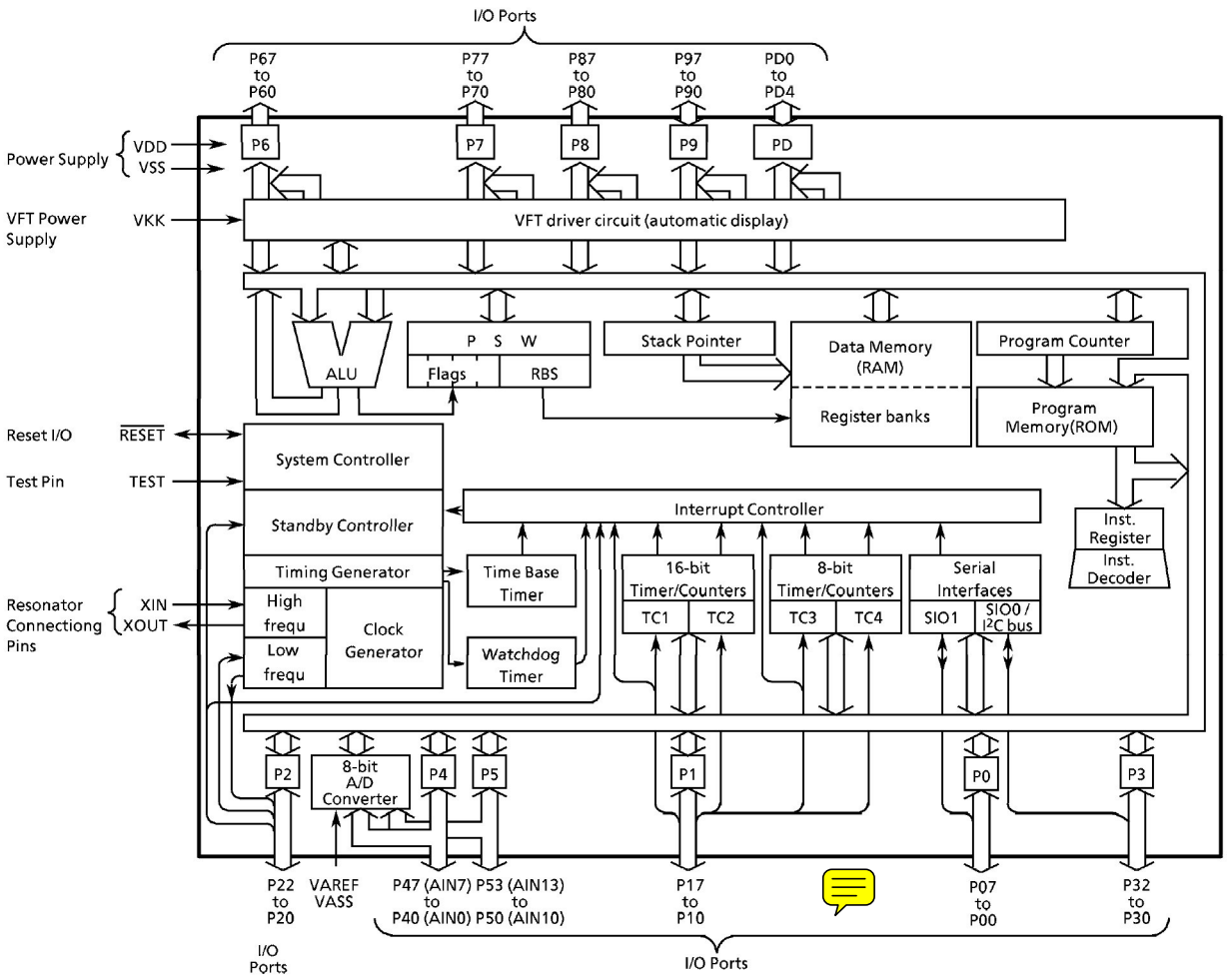


Figure 9-12

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Pin Function

Pin Name	Input / Output	Function	
P07 to P03	I/O	Two 8-bit programmable input/output ports (tri-state). Each bit of these ports can be individually configured as an input or an output under software control. When used as a SIO input/output, an External interrupt input, a timer/counter input, the latch must be set to "0". When used as a PPG output or divider output, the latch must be set to "1".	
P02 (SO1)	I/O (Output)		SIO1 serial data Output
P01 (SI1)	I/O (Input)		SIO1 serial data Input
P00 ($\overline{SCK1}$)	I/O (I/O)		SIO1 serial clock input/output
P17 (INT4/TC3)	I/O (Input)		External interrupt input 4 or Timer/Counter 3 input
P16 (INT2)			External interrupt input 2
P15 (INT3/TC1)			External interrupt input 3 or Timer/Counter 1 input
P14 (TC4/$\overline{PDO}$/$\overline{PWM}$)	I/O (I/O)		Timer counter 4 input or 8-bit programmable divider output or 8-bit PWM output
P13 ($\overline{DVO}$)	I/O (Output)		Divider output
P12 (TC2/$\overline{PPG}$)	I/O (I/O)		Timer counter 2 input or Programmable pulse generator output
P11 (INT1)	I/O (Input)		External interrupt input 1
P10 ($\overline{INT0}$)			External interrupt input 0
P22 (XTOUT)	I/O (Output)	3-bit input/output port with latch. When used as input port, or external interrupt input, STOP mode release signal input, the latch must be set to "1".	Resonator connecting pins (32.768 kHz). For inputting external clock, XTIN is used and XTOUT is opened.
P21 (XTIN)	I/O (Input)		
P20 ($\overline{INT5}$/$\overline{STOP}$)			External interrupt input 5 or STOP mode release signal input
P32 ($\overline{SCK0}$)	I/O (I/O)	3-bit programmable input/output ports (Sink open drain). Each bit of these ports can be individually configured as an input or an output under software control. When used as a I²C input/output, the latch must be set to "1".	SIO0 serial clock input/output
P31 (SDA/SO0)	I/O (I/O/Output)		I²Cbus serial data input/output or SIO0 serial data output
P30 (SCL/SI0)	I/O (I/O/Input)		I²Cbus serial clock input/output or SIO0 serial data Input
P47 (AIN7) to P40 (AIN0)	I/O (Input)	8-bit programmable input/output ports (tri-state). Each bit of these ports can be individually configured as an input or an output under software control. When used as a analog input, the P4CR must be set to "0".	A/D converter analog inputs
P53 (AIN13) to P50 (AIN10)	I/O (Input)	4-bit programmable input/output ports (tri-state). Each bit of these ports can be individually configured as an input or an output under software control. When used as a analog input, the P5CR must be set to "0".	A/D converter analog inputs
P67 (V7) to P60 (V0)	I/O (Output)	Four 8-bit high brackdown voltage output ports with the latch. When used as a VFT driver output, the latch must be cleared to "0".	VFT driver outputs
P77 (V15) to P70 (V8)			
P87 (V23) to P80 (V16)			
P97 (V31) to P90 (V24)			
PD4 (V36) toPD0 (V32)	I/O (Output)	5-bit high breakdown voltage output ports with the latch. When used as a VFT driver output, the latch must be cleared to "0".	

Figure 9-13

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Pin Name	Input / Output	Function
XIN, XOUT	Input, Output	Resonator connecting pins for high-frequency clock. For inputting external clock, XIN is used and XOUT is opened.
$\overline{\text{RESET}}$	I/O	Reset signal input or watchdog timer output/address-trap-reset output/system-clock-reset outputted.
TEST	Input	Test pin for out-going test. Be tied to low.
VDD, VSS	Power Supply	+ 5 V, 0 V (GND)
VKK		VFT driver power supply
VAREF, VASS		Analog reference voltage inputs (High, Low)

Figure 9-14

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IC7311 TEA 1507 MOBO Board, Power Supply Control

BLOCK DIAGRAM

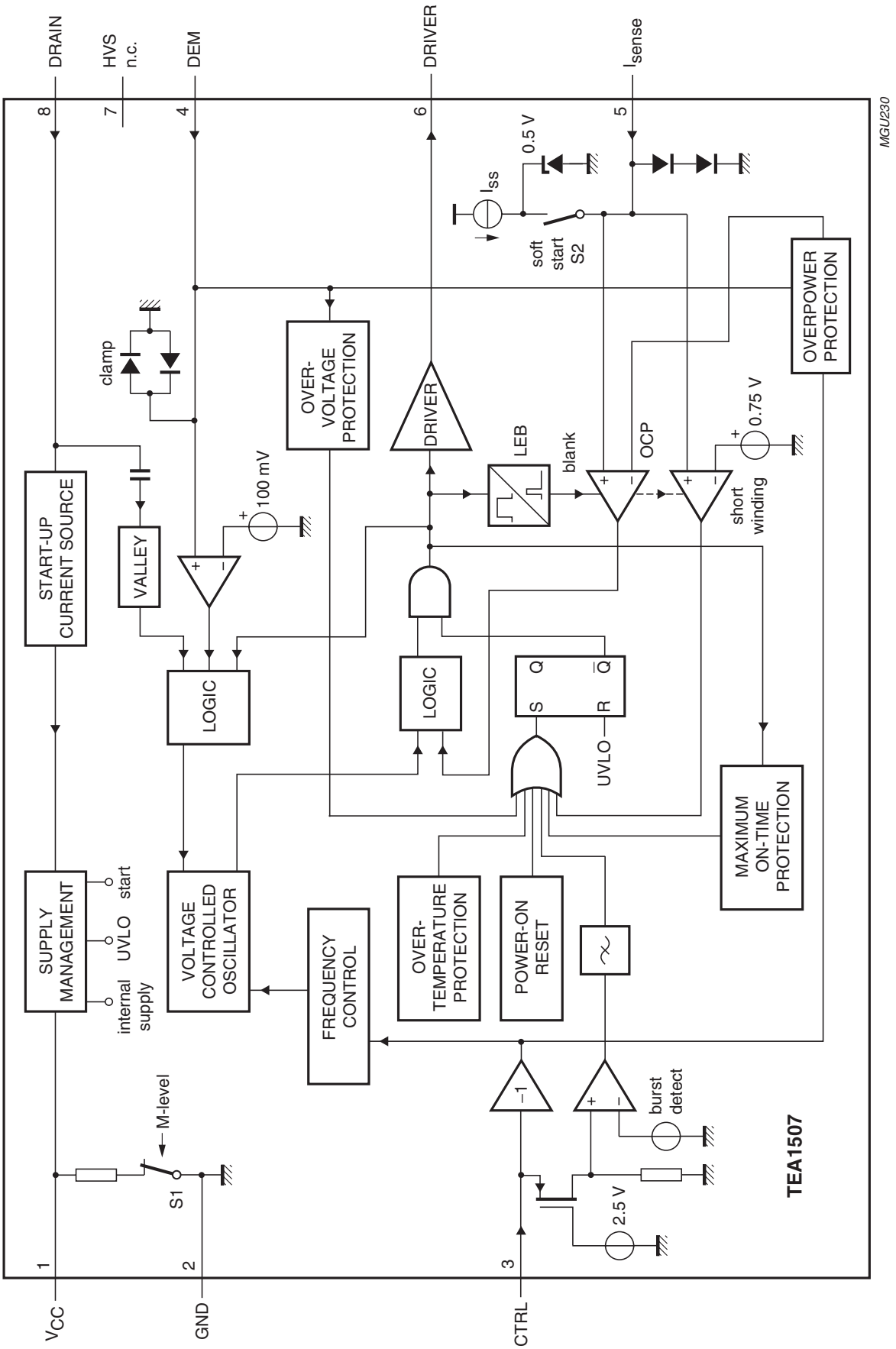

Fig.2 Block diagram.

Figure 9-15

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IC7402: STV6618 MOBO Board, Video Switch Matrix

1.2 Pin Description

Pin No.	Symbol	Description
1	Y/CVBSIN_TUN	Y/CVBS Input from Tuner
2	DIGOUT3	Digital Output Pin 3
3	GND1	Ground Supply 1 for Video Inputs
4	CVBSIN_ENC	CVBS Input from Encoder
5	DECV	Video decoupling capacitor
6	CIN_ENC	Chroma Input from Encoder
7	YIN_ENC	Y Input from Encoder
8	V_{CC}	+5 V Power Supply for Video Inputs
9	R/PR/CIN_ENC	Red or Pr or Chroma Input from Encoder
10	G/YIN_ENC	Green or Y Input from Encoder
11	B/PBIN_ENC	Blue or Pb Input from Encoder
12	GND2	Ground Supply 2 for Video Inputs
13	B/PBIN_AUX	Blue or Pb Input from Auxiliary (SCART2 or external Cinch)
14	DIGOUT4	Digital Output Pin 4
15	G/YIN_AUX	Green or Y Input from Auxiliary (SCART2 or external Cinch)
16	DIGOUT5	Digital Output Pin 5
17	R/PR/CIN_AUX	Red or Pr or Chroma input from Auxiliary (SCART2 or external Cinch)
18	DIGOUT6	Digital Output Pin 6
19	Y/CVBSIN_AUX	Y/CVBS Input from Auxiliary (SCART2 or external Cinch)
20	VCCB_REC	Video Output Recorder Buffer Supply Pin
21	Y/CVBSOUT_REC	Y/CVBS Output to Recorder
22	GNDB_REC	Ground Supply for Recorder Buffer
23	COUT_AUX	Chroma Output to Auxiliary (SCART2 or external Cinch)
24	VCCB1	Video Output Buffer Supply Pin
25	Y/CVBSOUT_AUX	Y/CVBS Output to Auxiliary (SCART2 or external Cinch)
26	GNDB	Ground Supply for Video Buffer
27	B/PBOUT_TV	Blue or Pb Output to TV (SCART1 or external Cinch)
28	C_GATE	External Transistor Command for Bidirectinnal B/C SCART I/O
29	G/YOUT_TV	Green or Y Output to TV (SCART1 or external Cinch)
30	VCCB2	Video Buffer
31	R/PR/COUT_TV	Red or Pr or Chroma Output to TV (SCART1 or external Cinch)
32	VCCB3	Video Output Buffer Supply Pin
33	Y/CVBSOUT_TV	Y/CVBS Output to TV (SCART1 or external Cinch)
34	FBOUT_TV	Fast Blanking Output to TV (SCART1)
35	FBIN_AUX	Fast Blanking Input from Auxiliary (SCART2)

Figure 9-16

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Pin No.	Symbol	Description
36	VDD	+5 V Digital Power Supply
37	SCL	I²C Bus Clock
38	SDA	I²C Bus Data
39	GNDD	Digital Ground Supply
40	CIN_TV	Chroma Input from TV (SCART1 or external Cinch)
41	Y/CVBSIN_TV	Y/CVBS Input from TV (SCART1 or external Cinch)
42	DIGOUT1	Digital Output Pin 1
43	CIN_TUN	Chroma Input from Tuner
44	DIGOUT2	Digital Output Pin 2

Figure 2: STV6618 Input/Output Diagram

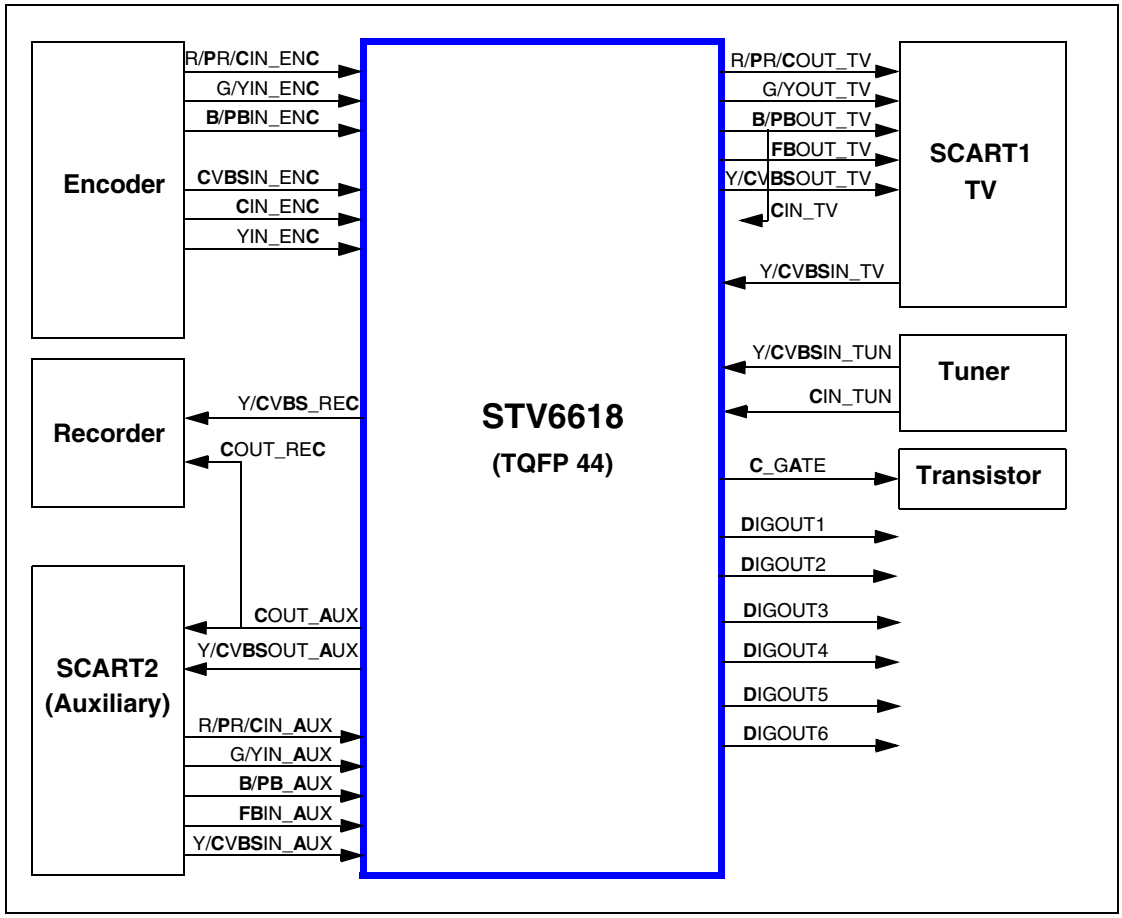

Figure 9-17

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Figure 3: STV6618 Block Diagram

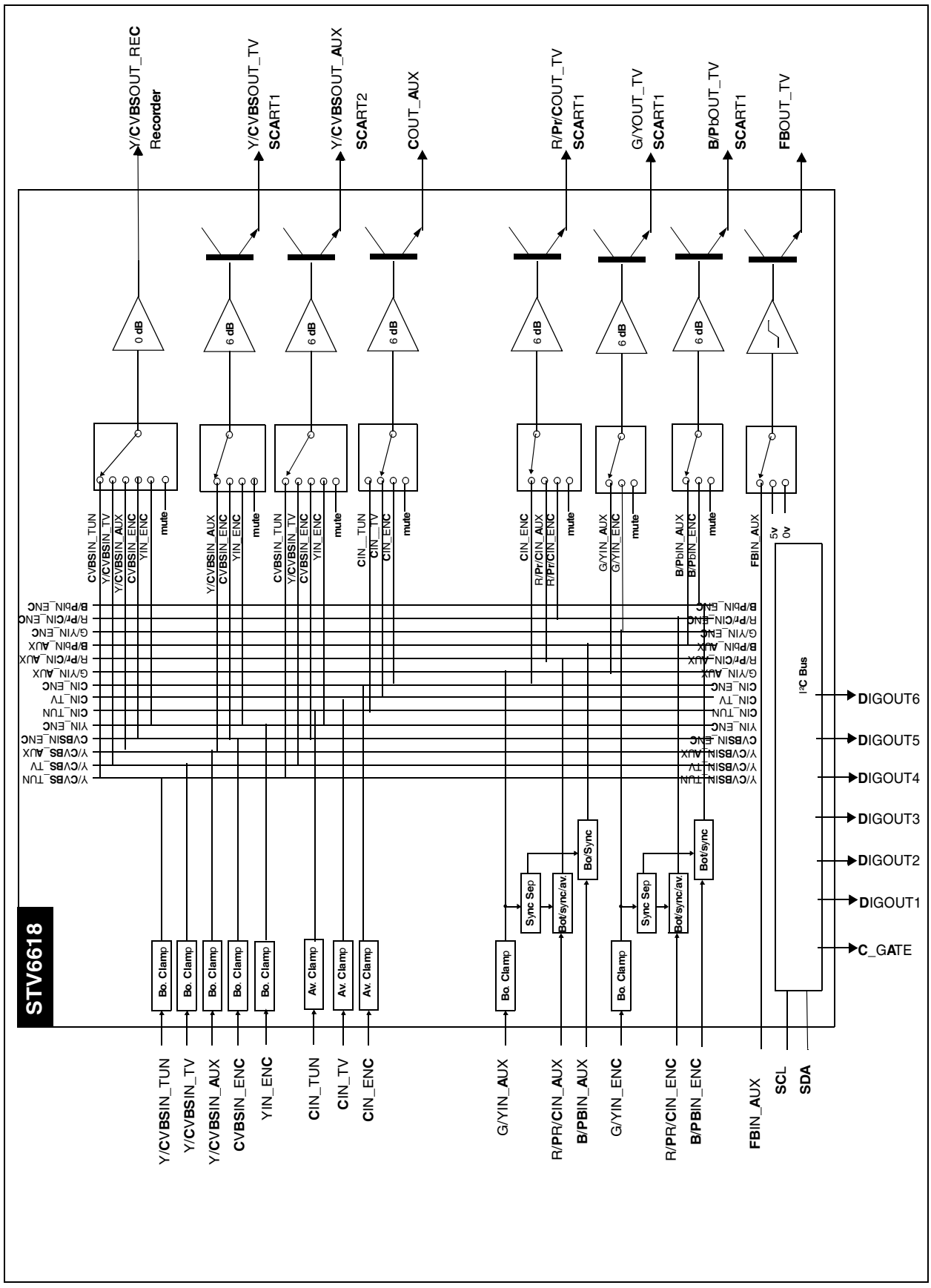

Figure 9-18

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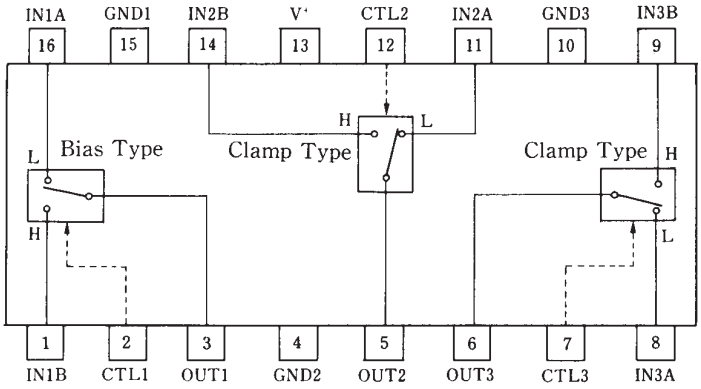
IC7401: NJM2285M MOBO Board, 2-Input 3 Channel Video Switch



NJM2285D
NJM2285M
NJM2285V

Figure 9-19

IC7600: MSP34x5G MOBO Board, Multi Sound Processor

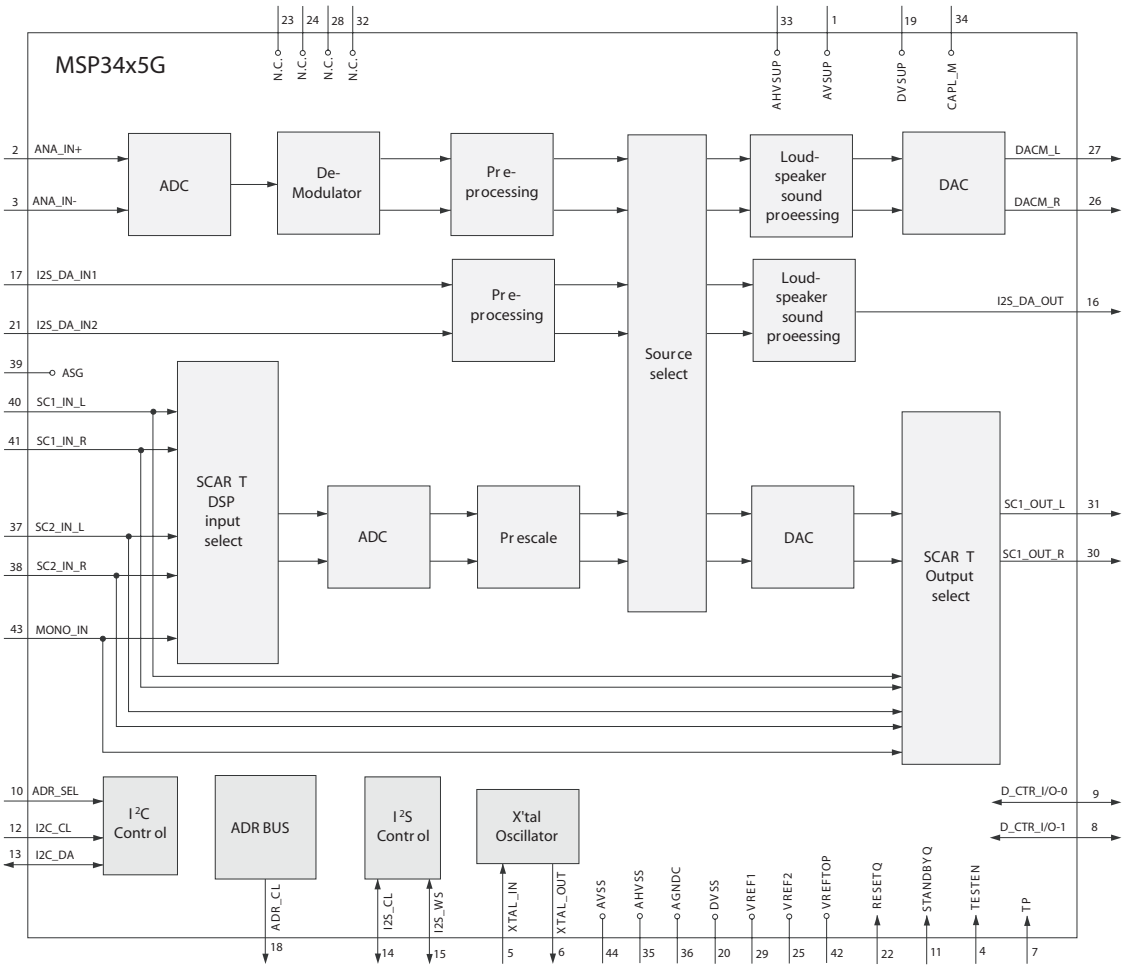


Figure 9-20

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9.3.2 FEBE Board

IC7008 / 7603 / 7607 / 7608, LD1117 FEBE Board, Voltage Regulator

BLOCK DIAGRAM

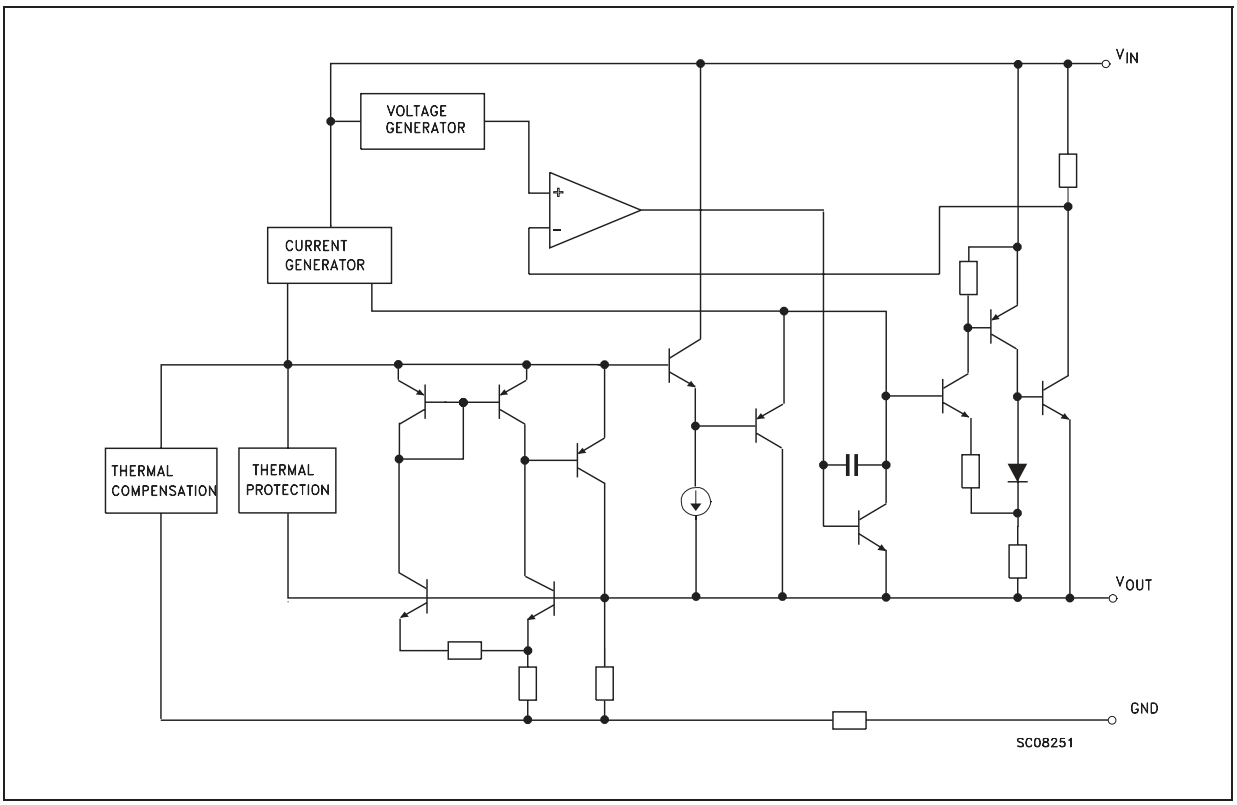

Figure 9-21

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IC7201, TZA1047: FEBE Baord, Analoque Processor

Block diagram

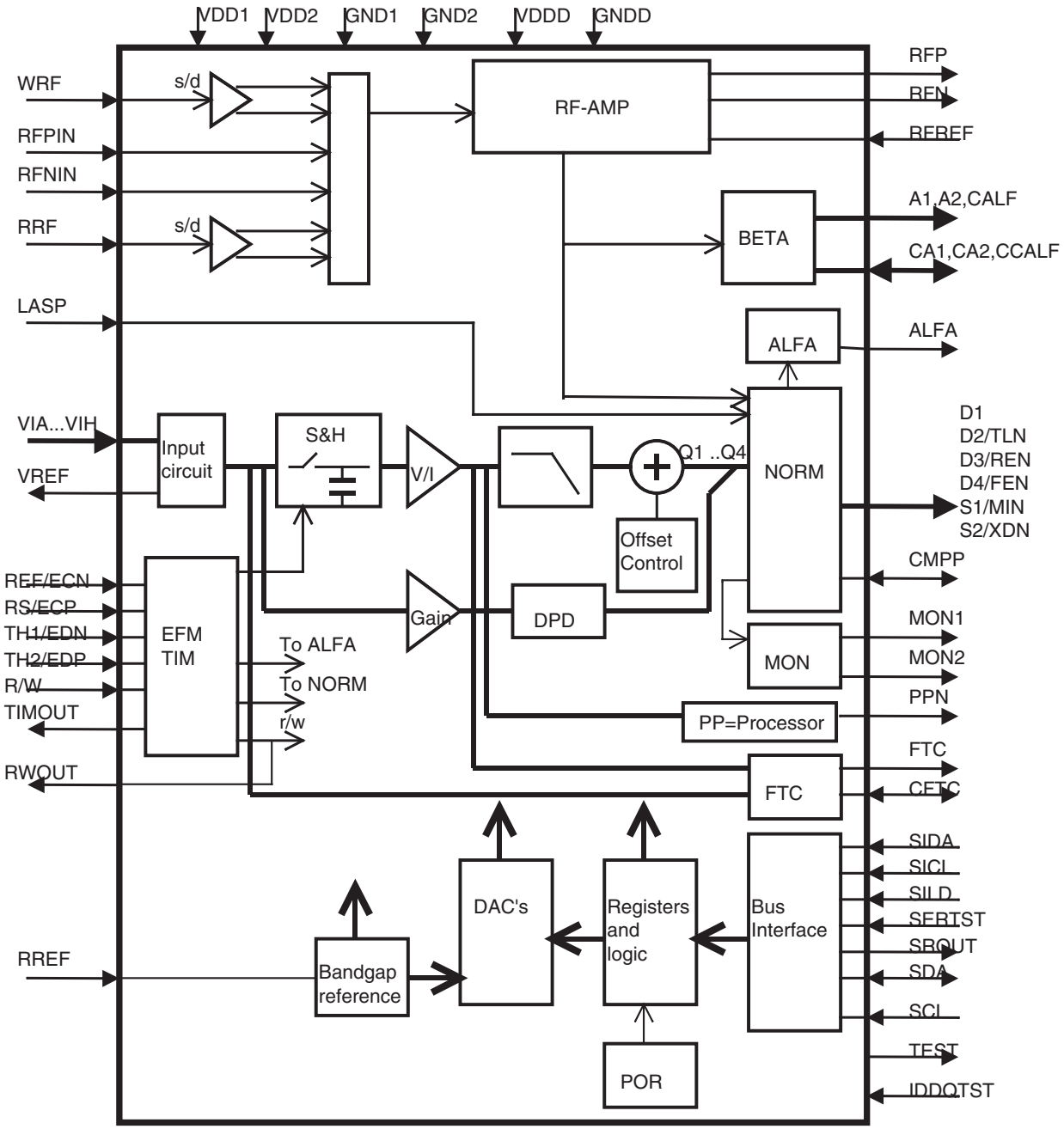

Fig 1. TZA1047 Block Diagram

Figure 9-22

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Pin description

Table 1: Pin description

Symbol	Pin	Description
VIH	1	Satellite segment H input
GND1	2	Ground
VIC	3	Central segment C input
VIB	4	Central segment B input
GND1	5	Ground
RFNIN	6	Inverse differential RF input / Single-ended RF read input
RFPIN	7	Differential RF input/ Single-ended RF write input
VDD1	8	Positive supply
VID	9	Central segment D input
VIA	10	Central segment A input
VDD1	11	Positive supply
VIE	12	Satellite segment E input
VIG	13	Satellite segment G input
RWOUT	14	R/W signal output
SDA	15	Data input/output I^2C
SCL	16	Clock input I^2C
SILD	17	Strobe line of serial bus interface
SIDA	18	Data line of serial bus interface
SICL	19	Clock line of serial bus interface
TIMOUT	20	EFMTIM test output
R/W	21	External Read/Write signal input
VDDD	22	Positive supply digital part
VSSD	23	digital ground
REF/ECN	24	Reference input for timing signals in EFMTIM bypass mode[1]/ Inverse EFM clock input[2]
RS/ECP	25	RF sampling signal[1]/ EFM clock input[2]
TH1/EDN	26	Segment sampling timing signal[1]/ Inverse EFM data input[2]
TH2/EDP	27	Segment sampling timing signal[1]/ EFM data input[2]
SERTST	28	Enable test mode (Tie to GND or leave open for normal operation)
VDD2	29	Positive supply voltage

Figure 9-23

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Table 1: Pin description *(Continued)*

Symbol	Pin	Description
GND2	30	Supply ground
RFP	31	RF output voltage, positive
RFN	32	RF output voltage, negative
RFREF	33	Reference voltage for differential RF output common mode level
PPN	34	Output PP voltage
CFTC	35	FTC high pass filter capacitor
FTC	36	FTC output
GND1	37	Supply ground
CA1	38	Beta circuit external capacitor
CA2	39	Beta circuit external capacitor
CCALF	40	Beta circuit external capacitor
RREF	41	Reference resistor to ground
GND1	42	Supply ground
CMPP	43	MPP external capacitor
VDD1	44	Positive supply
MON1	45	Monitor output voltage
MON2	46	Monitor output voltage
S2/XDN	47	Servo output current
S1/MIRN	48	Servo output current
D4/FEN	49	Servo output current
D3/REN	50	Servo output current
D2/TLN	51	Servo output current
D1	52	Servo output current
IDDQTST	53	Select zero dissipation mode (tie to GND for normal operation)
CALF	54	RF average level signal
A2	55	RF bottom level signal
A1	56	RF top level signal
SROUT	57	shift register output for register test mode
ALFA	58	alfa output current
LASP	59	laser power setpoint signal
TEST	60	Test output
RRF	61	Single ended RF read input voltage

Figure 9-24

Table 1: Pin description *(Continued)*

Symbol	Pin	Description
WRF	62	Single ended RF write input voltage
VREF	63	PDIC reference voltage output
VIF	64	Satellite segment F input

[1] Only in EFM bypass mode

[2] EFM clock and data when not in EFM bypass mode.

Figure 9-25

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IC7300, TZA1042: FEBE Baord, Laser Power Controller

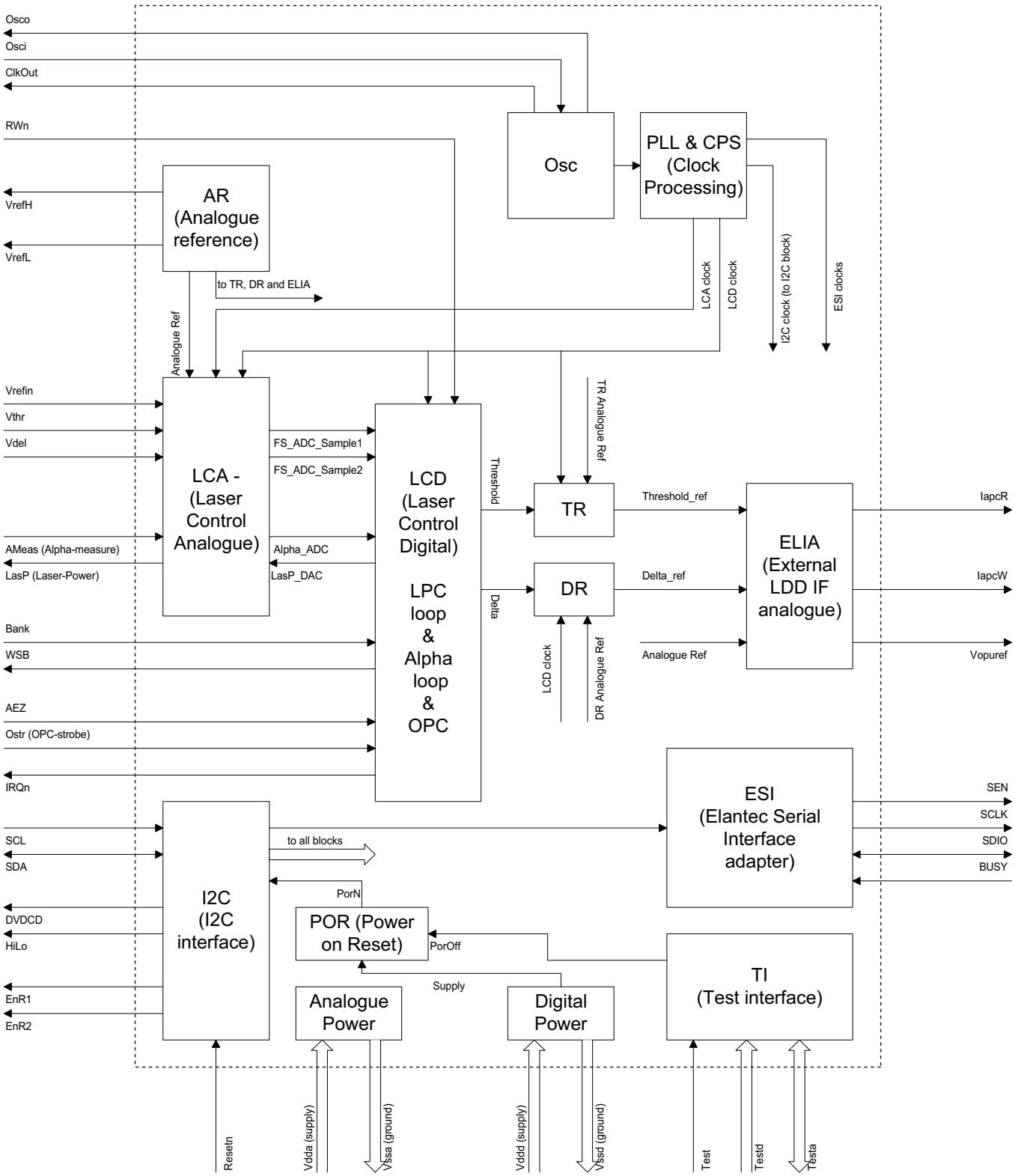

Figure 9-26

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Pin description

Symbol	Pin	Type	Drive /Thr.	Description
AEZ	1	I hy pd	T	Alpha Error Zero/Alpha Set Zero
V_{DDD3}	2	P	-	Digital Pad Supply
V_{SSD3}	3	P	-	Digital Pad Supply
CLOCKOUT	4	T	M	Buffered Oscillator Output
OSCO	5	AO	A	Output of inverting Amplifier that forms oscillator
OSCI	6	AI	A	Input of inverting Amplifier that forms oscillator
TEST1D	7	I pd	T	Test pin
AMEAS	8	AI	A	Alpha Measure – value of measured disk writing quality
V_{DDA1}	9	P	-	Analogue Supply
V_{SSA1}	10	P	-	Analogue Supply
LASP	11	AO	A	Laser Power – indicates power level
VREFL	12	AO	A	Bandgap Voltage Reference ground connection
VREFH	13	AO	A	Bandgap Voltage Reference output
VDEL	14	AI	A	Voltage input for Delta “laser power”
VTHR	15	AI	A	Voltage input for Threshold “laser power”
VOPUREF	16	AO	A	Reference Voltage for OPU
VREFIN	17	AI	A	Input Reference Voltage for Vthr and Vdel
V_{DDA2}	18	P	-	Analogue Supply
V_{SSA2}	19	P	-	Analogue Supply
TEST1A	20	AB	A	Test pin
IAPCW	21	AO	A	Current Output of Delta Reference
IAPCR	22	AO	A	Current Output of Threshold Reference
TEST2A	23	AB	A	Test pin
ENR2	24	T	M	Programmable Output Flag
ENR1	25	B pd	M/T	Device Initialisation/Programmable Output Flag (must be driven to VDD during reset)
DVDCD	26	T	M	Programmable Output Flag for indicating DVD/CD mode
HILO	27	T	M	Programmable Output Flag for indicating High/Low reflectivity
V_{SSD1}	28	P	-	Digital Pad Supply
V_{DDD1}	29	P	-	Digital Pad Supply
BUSY	30	B	M/T	Busy Enable input from Elantec / Board test IO
SEN	31	B	M/T	Serial Enable output to Elantec / Board test IO
SDIO	32	B	M/T	Serial data input output from/to Elantec / Board test IO
SCLK	33	B	M/T	Busy Enable input from Elantec / Board test IO
WSB	34	B	M/T	Write Strategy Bank – output controls OPU write switching / Board test IO

Figure 9-27

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Pin description...*continued*

Symbol	Pin	Type	Drive /Thr.	Description
IRQN	35	OD	M	Interrupt Request Not – active low interrupt request
OSTR	36	I hy pd	T	OPC Strobe – request step in alpha setpoint / Board test input
RESETN	37	I hy pd	T	Reset Not – active low reset input
RWN	38	B	M/T	Read/Write not – indicates power setpoints/Board test IO
V_{SSD2}	39	P	-	Digital Core Supply
V_{DDD2}	40	P	-	Digital Core Supply
BANK	41	I hy pd	T	CAV setpoint switching input signal / Board test IO
TEST2D	42	I pd	T	Test pin
SDA	43	BOD	M/T	I^2C Serial Data
SCL	44	I	T	I^2C Serial Clock

[1] All supply pins must be connected to the same external power supply voltage

[2] All inputs are 5V tolerant – i.e. they will drive the supply voltage (3.0-3.6V), but will work correctly when interface to a 5V drive device

[3] The pin type definition is given below:

PinType Definition Table

Type	Definition
I	input
O	output
OD	open drain
B	bi-directional
BOD	bi-directional open drain
T	tri-state output
AI	analog input
AO	analog output
AB	analog bi-directional
P	power connection
hy	hysteresis on input
pd	hysteresis on output

Figure 9-28

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PIN CONFIGURATION

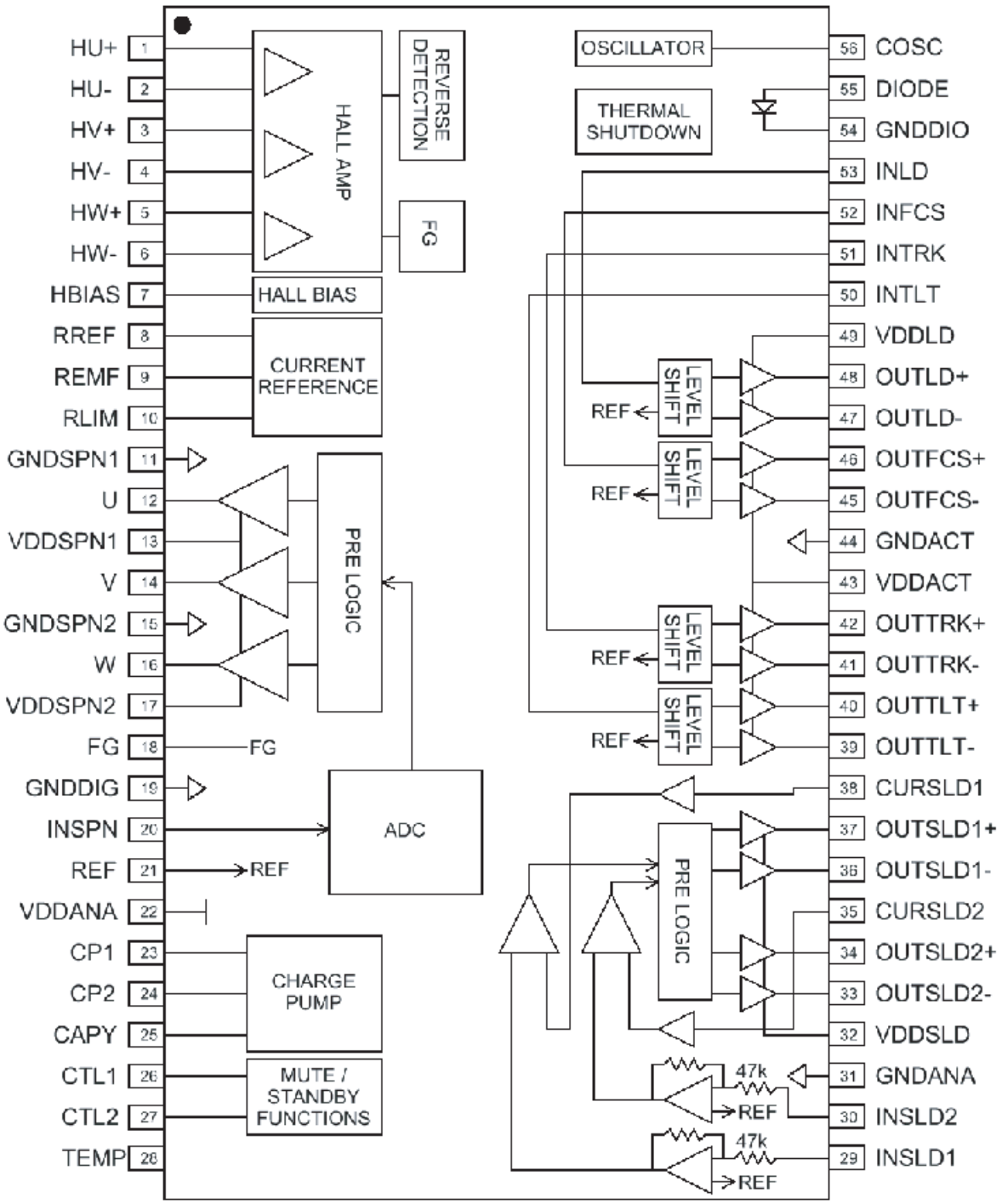

Fig.2 Block diagram SA56202.

Figure 9-29

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PIN DESCRIPTION

PIN	SYMBOL	DESCRIPTION	PIN	SYMBOL	DESCRIPTION
1	HU+	positive Hall input U	56	COSC	ext. capacitor for int. oscillator
2	HU-	negative Hall input U	55	DIODE	diode for temperature readout
3	HV+	positive Hall input V	54	GNDDIO	temperature diode ground
4	HV-	negative Hall input V	53	INLD	loading driver input
5	HW+	positive Hall input W	52	INFCS	focus driver input
6	HW-	negative Hall input W	51	INTRK	tracking driver input
7	HBIAS	Hall element bias	50	INTLT	tilting driver input
8	RREF	ext. res. for current reference	49	VDDLD	loading driver power supply
9	REMF	ext. res. for EMF regeneration	48	OUTLD+	loading driver positive output
10	RLIM	ext. res. for current limit	47	OUTLD-	loading driver negative output
11	GNDSPN1	spindle driver power ground 1	46	OUTFCS+	focus driver positive output
12	U	spindle driver output U	45	OUTFCS-	focus driver negative output
13	VDDSPN1	spindle driver power supply 1	44	GNDACT	actuator drivers power ground
14	V	spindle driver output V	43	VDDACT	actuator drivers power supply
15	GNDSPN2	spindle driver power ground 2	42	OUTTRK+	tracking driver pos. output
16	W	spindle driver output W	41	OUTTRK-	tracking driver neg. output
17	VDDSPN2	spindle driver power supply 2	40	OUTTLT+	tilting driver pos. output
18	FG	frequency generator output	39	OUTTLT-	tilting driver neg. output
19	GNDDIG	ground supply	38	CURSLD1	sled driver 1 current sense
20	INSPN	spindle driver input	37	OUTSLD1+	sled driver 1 positive output
21	REF	reference input voltage	36	OUTSLD1-	sled driver 1 negative output
22	VDDANA	system supply voltage	35	CURSLD2	sled driver 2 current sense
23	CP1	charge pump cap. conn. 1	34	OUTSLD2+	sled driver 2 positive output
24	CP2	charge pump cap. conn. 2	33	OUTSLD2-	sled driver 2 negative output
25	CAPY	charge pump output voltage	32	VDDSLD	sled driver power supply
26	CTL1	driver logic control input 1	31	GNDANA	ground supply
27	CTL2	driver logic control input 2	30	INSLD2	sled driver 2 input
28	TEMP	thermal warning	29	INSLD1	sled driver 1 input

Figure 9-30

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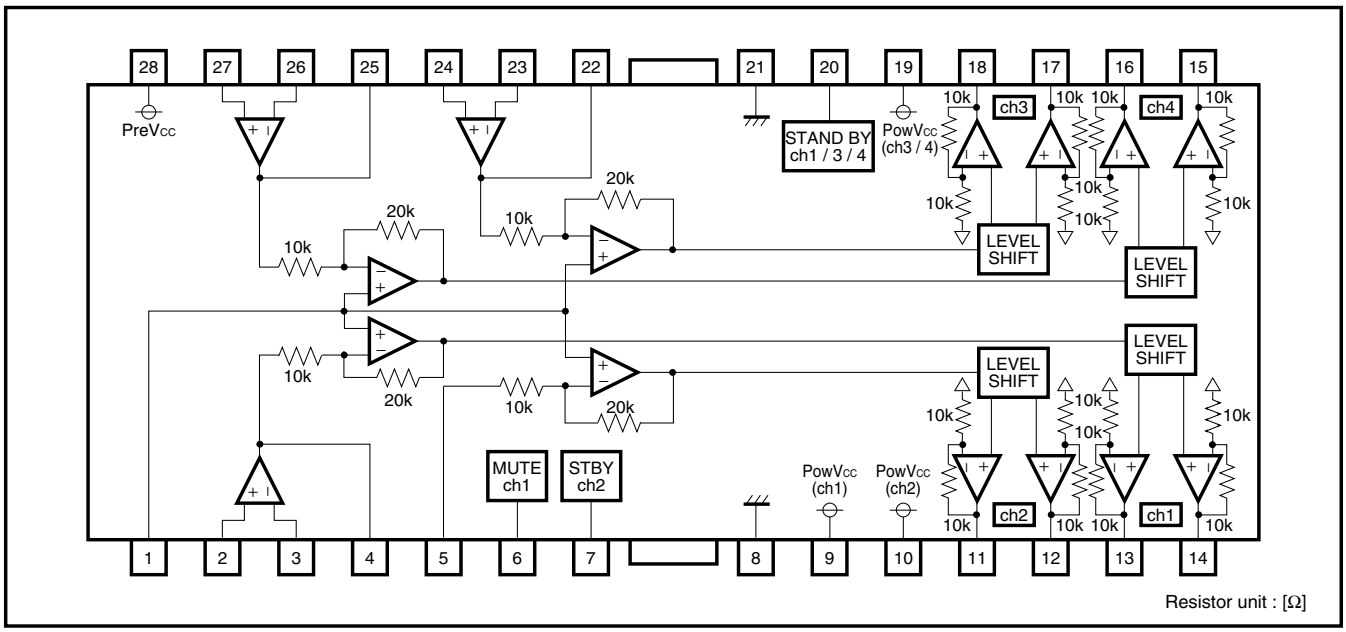
IC7409 BA5995: FEBE Board, 4-channel BTL driver

●Block diagram



●Pin descriptions

Pin No.	Pin name	Function
1	BIAS IN	Input for bias-amplifier
2	OPIN1 (+)	Non inverting input for CH1 OP-AMP
3	OPIN1 (–)	Inverting input for CH1 OP-AMP
4	OPOUT1	Output for CH1 OP-AMP
5	IN2	Input for CH2
6	MUTE	Input for CH1 mute control
7	STBY2	Input for CH2 stand by control
8	GND	Substrate ground
9	PowVcc1	Vcc for CH1 power block
10	PowVcc2	Vcc for CH2 power block
11	V_{O2} (–)	Inverted output of CH2
12	V_{O2} (+)	Non inverted output of CH2
13	V_{O1} (–)	Inverted output of CH1
14	V_{O1} (+)	Non inverted output of CH1

Pin No.	Pin name	Function
15	V_{O4} (+)	Non inverted output of CH4
16	V_{O4} (–)	Inverted output of CH4
17	V_{O3} (+)	Non inverted output of CH3
18	V_{O3} (–)	Inverted output of CH3
19	PowVcc3	Vcc for CH3/4 power block
20	STBY1	Input for CH1/3/4 stand by control
21	GND	Substrate ground
22	OPOUT3	Output for CH3 OP-AMP
23	OPIN3 (–)	Inverting input for CH3 OP-AMP
24	OPIN3 (+)	Non inverting input for CH3 OP-AMP
25	OPOUT4	Output for CH4 OP-AMP
26	OPIN4 (–)	Inverting input for CH4 OP-AMP
27	OPIN4 (+)	Non inverting input for CH4 OP-AMP
28	PreVcc	Vcc for pre block

Note) Symbol of + and – (output of drivers) means polarity to input pin.

Figure 9-31

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IC7500, PNX7850: FEBE Board, Channel Codec/Buffer Manager/Servo Processor and Controller

Nexperia PNX7850 conceptual block diagram

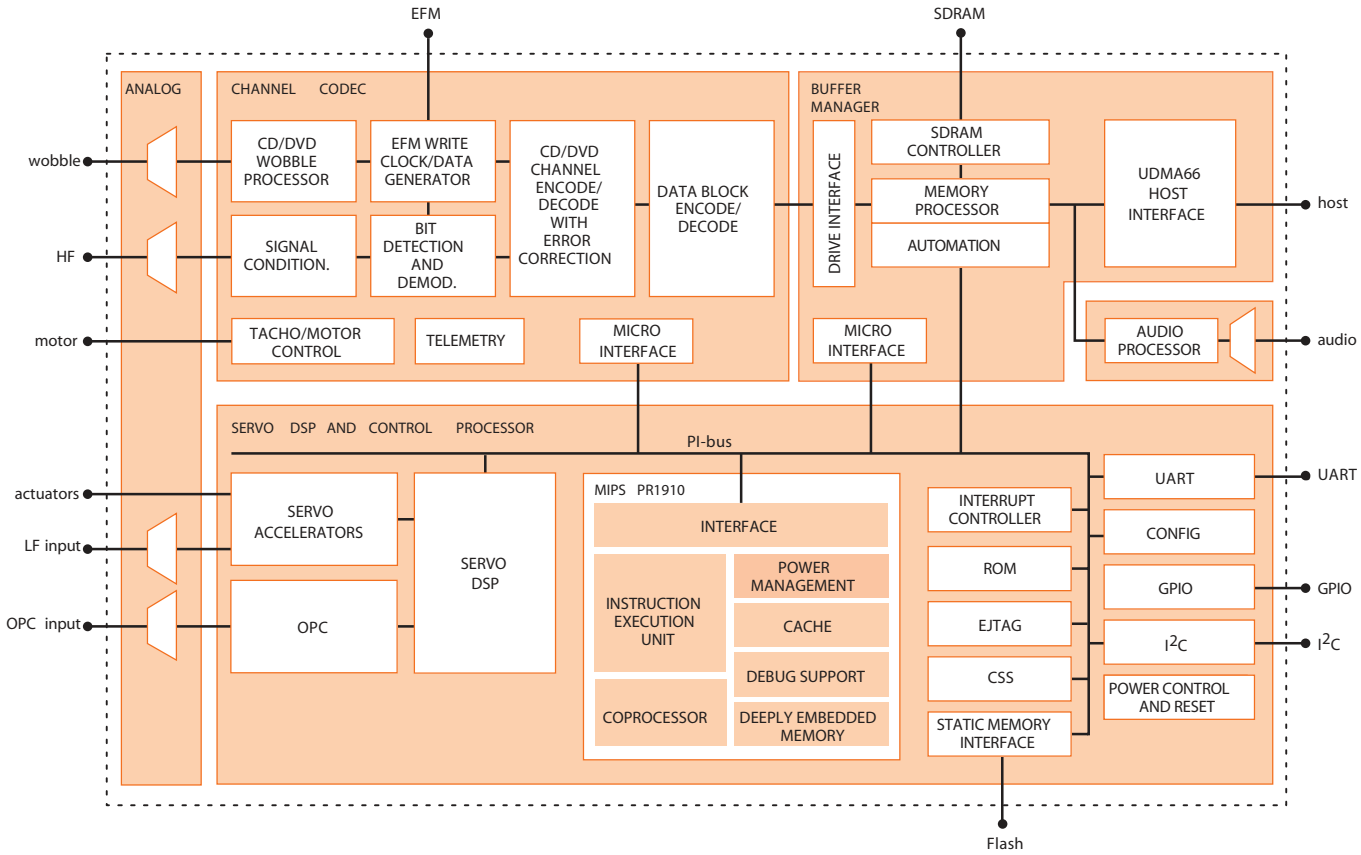

Figure 9-32

IC7926 NCP303LSN, FEBE Board , Reset Circuit

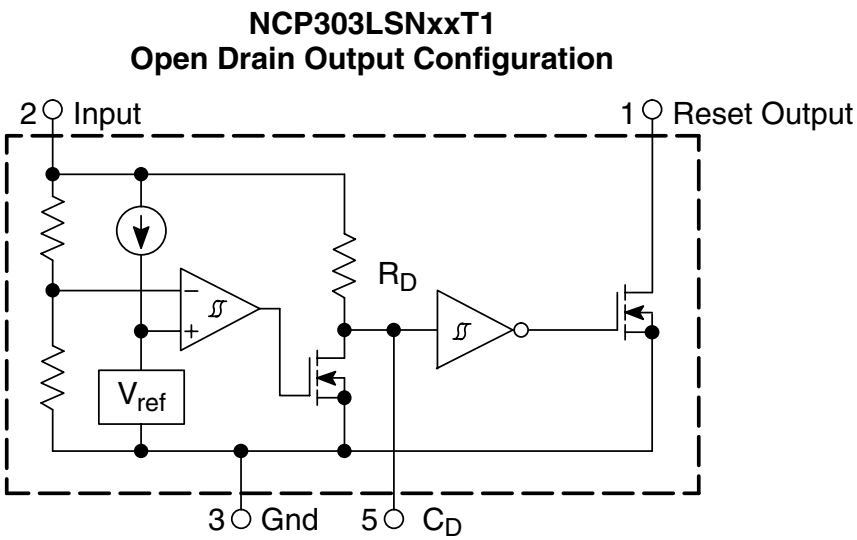

Figure 9-33

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IC7929 NCP1570D, FEBE Board, DC/DC Converter Control

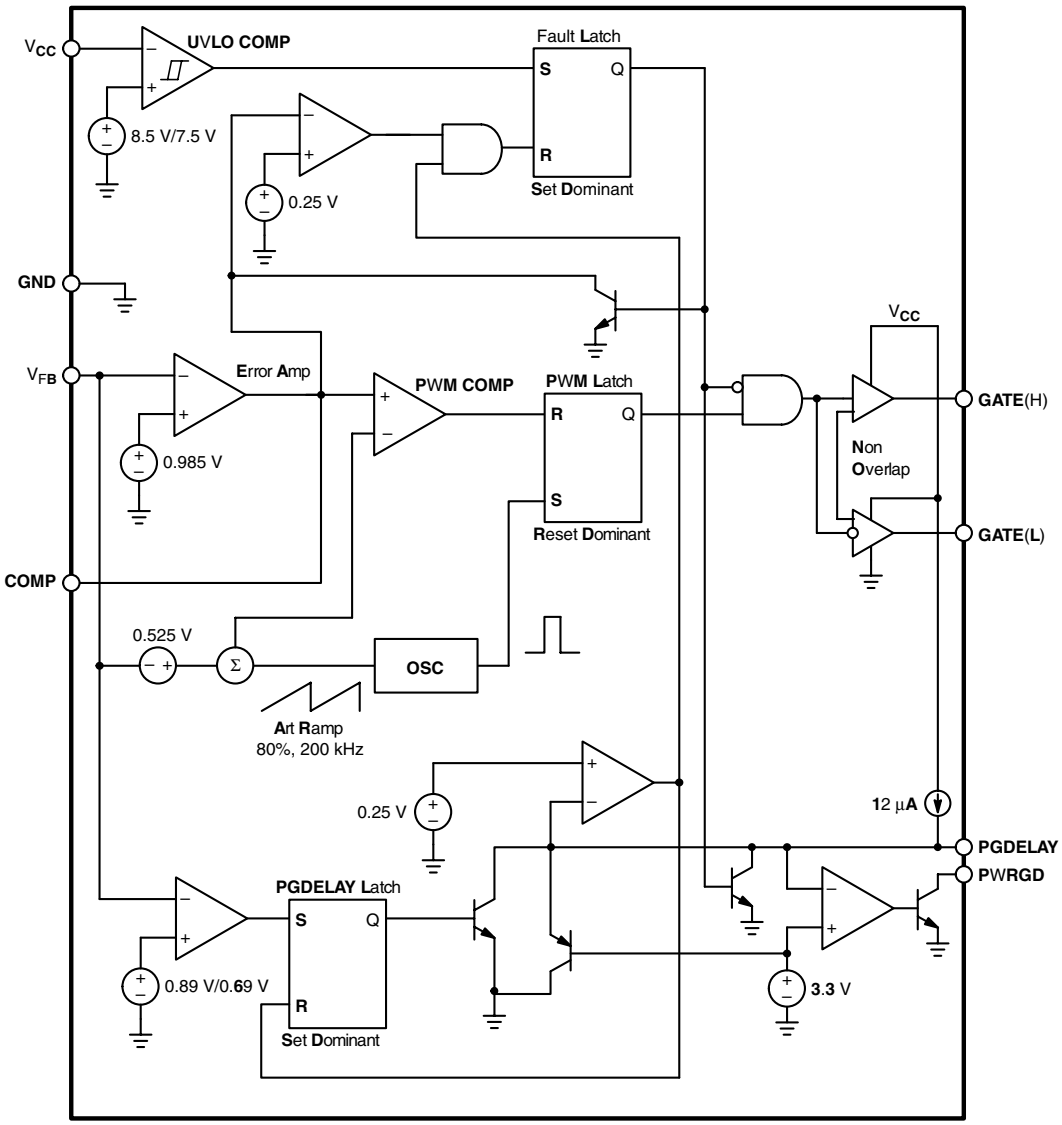

Figure 9-34

PACKAGE PIN DESCRIPTION

PACKAGE PIN # SO–8	PIN SYMBOL	FUNCTION
1	V_{CC}	Power supply input.
2	PWRGD	Open collector output goes low when V_{FB} is out of regulation. User must externally limit current into this pin to less than 20 mA.
3	PGDELAY	External capacitor programs PWRGD low–to–high transition delay.
4	COMP	Error amp output. PWM comparator reference i nput. A capacitor to LGND provides error amp compensation and S oft Start. Pulling pin < 0.45 locks gate outputs to a zero percent duty cycle state.
5	GATE(H)	High–side switch FET driver pin. Capable of delivering peak currents of 1.5 A.
6	GATE(L)	Low–side synchronous FET driver pin. Capable of delivering peak currents of 1.5 A.
7	V_{FB}	Error amplifier and PWM comparator i nput.
8	GND	Power supply return.

Figure 9-35

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9.4 List of Abbreviations

MOBO (Analog) Board

+5VSTBY	Permanent Supply 5V
8SC2	Pin8 Scart2 (only for Europe)
A_DATA	Data from Analog- to Digital-Board (UART-Communication)
A_RDY	Analog-board ready (status information to digital-board)
A18 - A19	Parallel Address Bus (CC - Flash-ROM and S-RAM)
A8 - A17	Parallel Address Bus (CC - Flash-ROM and S-RAM)
AD0 - AD7	Parallel Address Bus (CC - Flash-ROM and S-RAM)
AFC	Automatic Frequency Control
AFEL	Audio Frontend Left
AFER	Audio Frontend Right
AGC / WSRI	Automatic Gain Control (for Europe), Wide Screen Rear In (for NTSC)
AINFL	Audio In Front Left
AINFR	Audio In Front Right
AKILL	Audio Kill Signal
ALADC	Audio Left to ADC
ALDAC	Audio Left from DAC
ALE	Address Latch Enable
AM0	Adress-mode 0
AM1	Adress-mode 1
ARADC	Audio Right to ADC
ARDAC	Audio Right from DAC
ASCC1	Audio Scart 1 Mute (System Clock Output for Real time Clock-Adjustment)
AVCC	Power Supply for A/D-converter
AVSS	GND-Pin for A/D-converter
CFIN	Chroma Front In
CS0_	Chip Select 0 (CC - S-RAM)
CS2_	Chip Select 2 (CC - Flash-ROM)
CVBSFIN	Video Front In
D_DATA	Data from Digital- to Analog-Board (UART-Communication)
D_RDY	Digital-board ready (status information from digital-board)
DAC_MUTE	Mute Signal for DAC
DAOUT	Digital Audio Out
DVAL	Audio from Digital Video In Left
DVAR	Audio from Digital Video In Right
DVCC1	Power Supply Pin
DVCC2	Power Supply Pin
DVCC3	Power Supply Pin
DVSS1	GND Pin
DVSS2	GND Pin
DVSS3	GND Pin
FAN_OFF	Fan for Basic engine
FBIN	Fast Blanking input
FOME	FOllow ME Status line (matching signals yes/no; only for Europe)
G1…10	DISPLAY GRID
INT	Interrupt OUT for the CC
INT	Interrupt – line from Display Print
ION	Inverse ON-Line
IPFAIL	Inverse Power Fail Detection
IPOR	Inverse Power On Reset
IRESET	Inverse Reset Input
K1	Key-Input-Line
K2	Key-Input-Line
KILL	Signal from IR-Receiver
P50 IN	P50 INput-line (only for Europe)
P50 OUT	P50 OUTput-line (only for Europe)
POR_DC	Power On Reset for Display Control Print (Ext_DL)
PSS	Output Enable ReaD (CC - Flash-ROM and S-RAM)
PWM_FIL	Control line for Filament Voltage Generation
PWONSW	Amplifier Switch Audio A/D Converter
RD_	Pal/Secam-Select
RECLED	Control Signal for REC-LED
RESET_DIG	Reset Line to Digital Board
RP_	Inverse Reset line to Flash-ROM
RSA1/2	Record Selector 1/2
RY/BY_	Ready/Busy – input line (from Flash-ROM)
SIF1	Sound intermediate frequency
SB1	Secam Band 1 (PCB-Test entrance)
SCL	IC-Bus
SCLSW	Switched I^2C-Bus
SDA	IC-Bus
SDASW	Switched I^2C-Bus
SFS_TS	SAW Filter Select Trap Select
STBY	Standby-Line (Flash_Toshiba)
SYNC	Video Sync input
TEMP_SENSE	Temperature Sense Line
VER	HW-version input
VFV	Video from Frontend
VKK	VFT Driver Power Supply
VREFH	Pin for Reference-voltage input to A/D-converter
VREFL	Pin for Reference-voltage input to A/D-converter
VS1/2	View Selector 1/2
WR_	Write Enable (CC - Flash-ROM and S-RAM)
WSFI	Wide Screen Signalling Front In
WU	Wake Up
X1	Oscillator Pin
X12	Oscillator Pin
XIN	Oscillator Pin
XOUT	Oscillator Pin
XT1	Low Frequency Oscillator Pin
XT2	Low Frequency Oscillator Pin
YFIN	Luminance Front In

FEBE Board (Backend part)

ADC	Analog to Digital Converter
DAC	Digital to Analog Converter
DENC	Digital (Video) Encoder (Video DAC)
DV	Digital Video (Camcorder)
EF	Emitter Follower
OSD	On-Screen Display
VIP	Video Input Processor (Video ADC)
2Fh	Progressive scan video
2V5	+2V5 Power supply for Link+Codec IC7431
3V3	+3V3 Power supply
3V3_A	+3V3 Analog power supply for PHY IC7400
3V3_D	+3V3 Digital power supply for PHY IC7400
3V3_DLY	+3V3 Power supply for IC7500
3V3_LINK	+3V3 Power supply for Link+Codec IC7431
3V3_F	+3V3 Power supply for optional Flash memory IC7432
3V3_RAM	+3V3 Power supply for SDRAM IC7430
3V3_uP	+3V3 Power supply for Micro-controller IC7802
3V3_32kHz	+3V3 Power supply for audio format adaptation circuitry IC7507 and IC7508
3V3_AC	+3V3 Power supply for audio system clock generator IC7605 and IC7606
+5V	+5V Power supply
5V_PLL	+5V Power supply for VCO of audio PLL IC7604
A (1:17)	Flash address lines of uPD72893

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A_MUTE	Audio Mute
ABCK	Audio Bit Clock
AD (1:10)	Address bus lines for Host I/F of Link+Codec IC7431
AEMP1	PCM1 emphasis ON/OFF for PCM1 output
AFS1	Audio sampling frequency indication signal
ALRCLK	Audio Word Select
AMCLK44	11.2896MHz (=256 * 44.1 kHz) audio master clock signal for 44.1 kHz audio
AMCLK48	12.288MHz (=256 * 48 kHz) audio master clock signal for 32 kHz and 48 kHz audio
APWM	PWM signal for audio PLL
ASIC	Application Specific Integrated Circuit
BUFENn_AUD	Buffer Enable Audio
BUFENn_VID	Buffer Enable Video
CLK27M_CON	27MHz Clock to Digital Board
CS	Parallel interface chip select input of Link+Codec IC7431
CTL (0:1)	Link interface control lines
CTSN	Clear to Send
D (0:15)	Flash data lines of Link+Codec IC7431
DCDi	Directional Correlational Deinterlacing. Circuitry that reduces jaggies on diagonal edges when deinterlacing video-sourced material.
DV_STATUS	Interrupt pin for reading DV-status
HS_CLK	Video clock input of Link+Codec IC7431
INT	Interrupt request output of Link+Codec IC7431 (input to Micro-Controller)
IOR	Parallel interface IO read control input of Link+Codec IC7431
ISPN	In System Programming signal (used for programming IC7802)
LKON	Link-on signal outputLPSLink power status inputLREQLink request input
MA (0:10)	SDRAM address lines of Link+Codec IC7431
MCAS	SDRAM column address strobe signal
MCLK	SDRAM clock signal
MD (0:15)	SDRAM data lines of Link+Codec IC7431
MRAS	SDRAM row-address strobe signal
MWE	SDRAM write enable signal
PCM1	Audio Serial Data Output of Link+Codec IC7431
PCM1_NEW	'MSB justified' to I2S converted audio serial data; audio serial data input of audio DAC UDA1334A
PD (0:15)	Data bus lines for Host I/F of Link+Codec IC7431
PHY_D (0:7)	Data bus connection between PHY and LINK device
RESETn	DVIO board reset
RESET_FM	Reset signal driven by Flashmaster programming device
RESTB	Reset input of Link+Codec IC7431
RTSN	Request to Send
RWZ	Parallel interface read/write control input of Link+Codec IC7431
RXD	Receive Data
SCLK	Link control output clock
TXD	Transmit Data
VPP	+10V switchable programming voltage of microcontroller
YUV (0:7)	Digital Video

FEBE Board (Frontend part)

ADC	Analogue to Digital Converter
ADIP	ADdress In Pre-groove
AGC	Automatic Gain Control
CD	Compact Disc
CLV	Constant Linear Velocity
DROPPI	Dvd Rewritable Opu Pre-Processor IC
AM	Amplitude Modulation
BE	Basic Engine
ComPair	Computer aided rePair
CD-DA	CD Digital Audio
CS	Chip Select
DAC	Digital to Analogue Converter
DAIO	Digital Audio Input Output
DENC	Digital Encoder
DFU	Direction For Use: description for the end user
DNR	Dynamic Noise Reduction
DRAM	Dynamic RAM
DSD	Direct Stream Digital
DSP	Digital Signal Processing
DVD	Digital Versatile Disc
EEPROM	Electrical Erasable Programmable ROM
EFM	Eight to Fourteen bit Modulation
FDS	Full Diagnostic Software
HF	High Frequency
I^2C	Integrated Ic bus (signals at 5V level)
I2S	Integrated Ic Sound bus (signals at 3.3V level)
IC	Integrated Circuit
IF	Intermediate Frequency
IRQ	Interrupt ReQuest
LADIC	LAser Driver IC
LLD	Loss Less Decoder
LPCM	Linear Pulse Code Modulation
LRCLK	Left/Right CLocK
MACE	Mini All Cd Engine
MPEG	Motion Pictures Experts Group
NC	Not Connected
NVM	Non Volatile Memory: IC containing DVD related data e.g. alignments
OPC	Optimum Power Calibration
OPU	Optical Pickup Unit
PCB	Printed Circuit Board (see PWB)
PCS	Position Control Sledge
PLL	Phase Locked Loop
PCM	Pulse Code Modulation
PCM_CLK	Audio system clock for DAC
PCM_OUTx	Audio serial output data
PSU	Power Supply Unit
PWB	Printed Wiring Board (see PCB)
RAM	Random Access Memory
RGB	Red, Green and Blue colour space
ROM	Read Only Memory
RF	Radio Frequency
S2B	Serial to Basic engine, communication bus between host- and servo processor
SCL	Serial Clock I^2C
SCLK	Audio serial bit clock
SDA	Serial Data I^2C
SDRAM	Synchronous DRAM
SMC	Surface Mounted Components
S/PDIF	Sony Philips Digital InterFace
SPIDRE	Signal Processing Ic for Dvd REwritable
SRAM	Static Random Access Memory
STBY	STandBY
SVCD	Super Video CD
SW	SoftWare
THD	Total Harmonic Distortion
TTL	Transistor Transistor Logic (5V logic)
uP	Microprocessor
VCD	Video CD
Y/C	Luminance (Y) and Chrominance (C) signal
YUV	Component video

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10. Spare Parts List

10.1 Exploded View of FEBE Module (VAU8041)

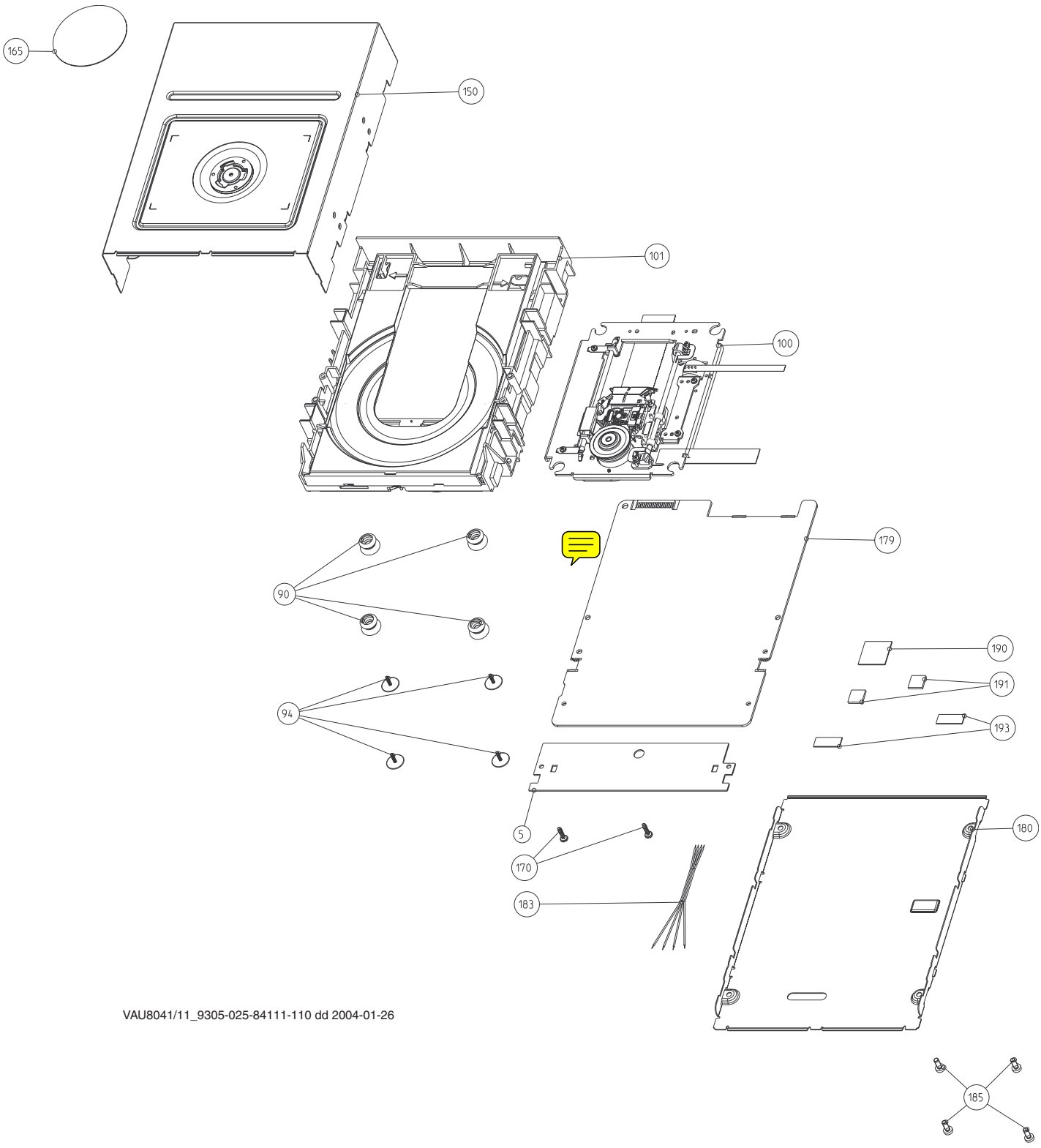

Figure 10-1

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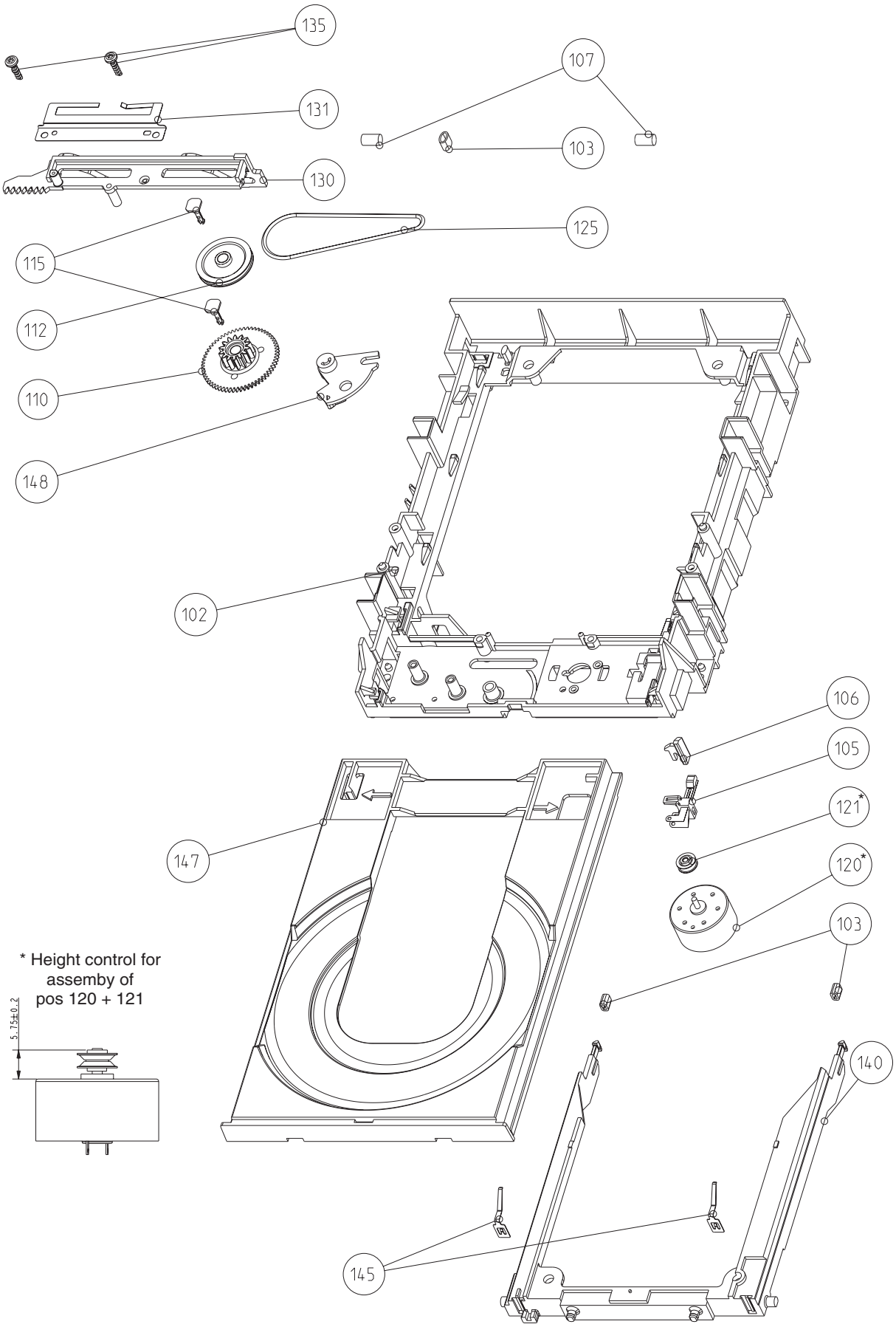
10.2 Exploded View of the Loader Mechanism



AV3.5 Loader Assy_3139-197-60291-110 dd 2004-02-13 (POS)

Figure 10-2

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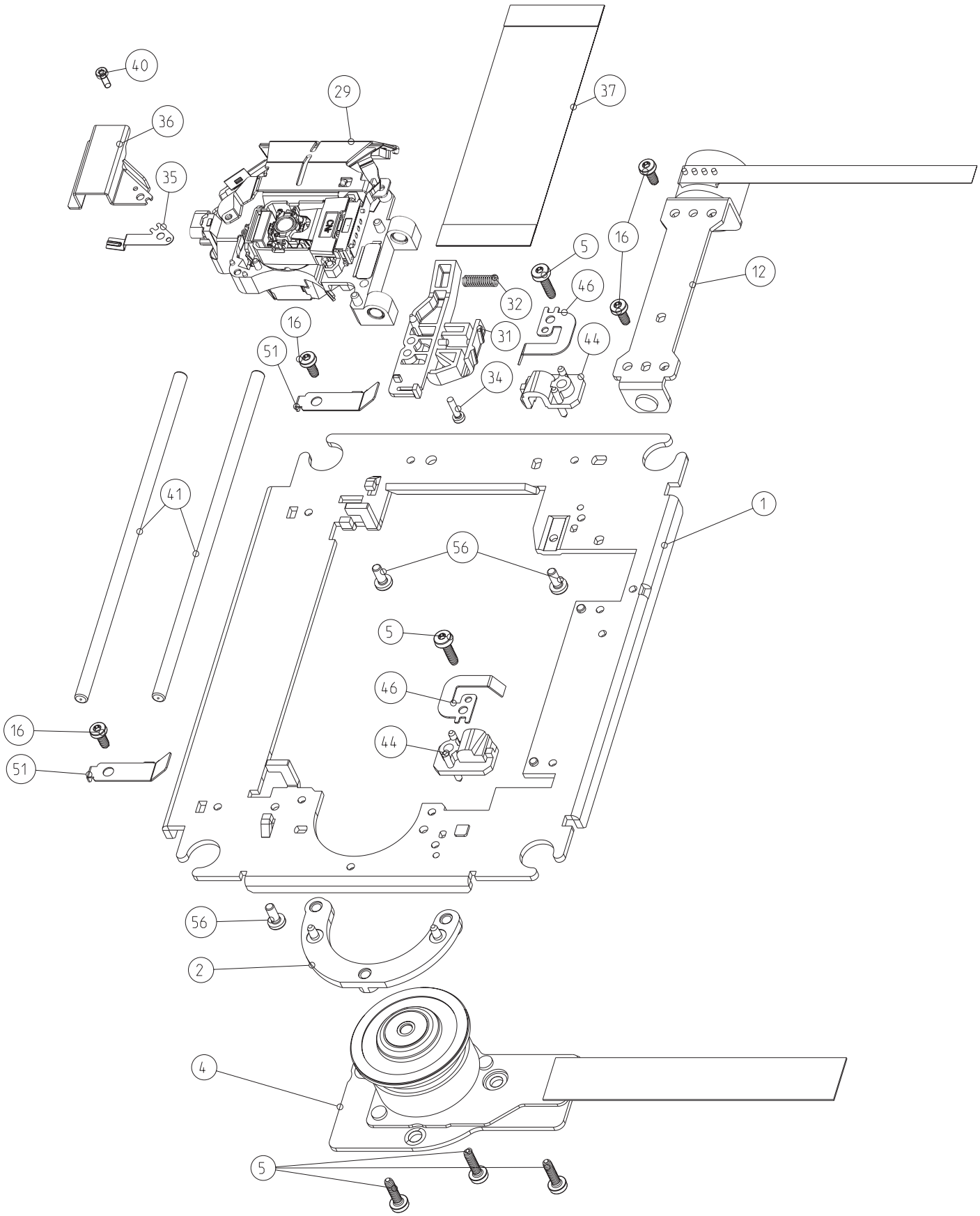
10.3 Exploded View of the DVDR Drive Mechanism



AV3.5 Mechanism_3139-197-50301-110 dd 2004-02-13 (POS)

Figure 10-3

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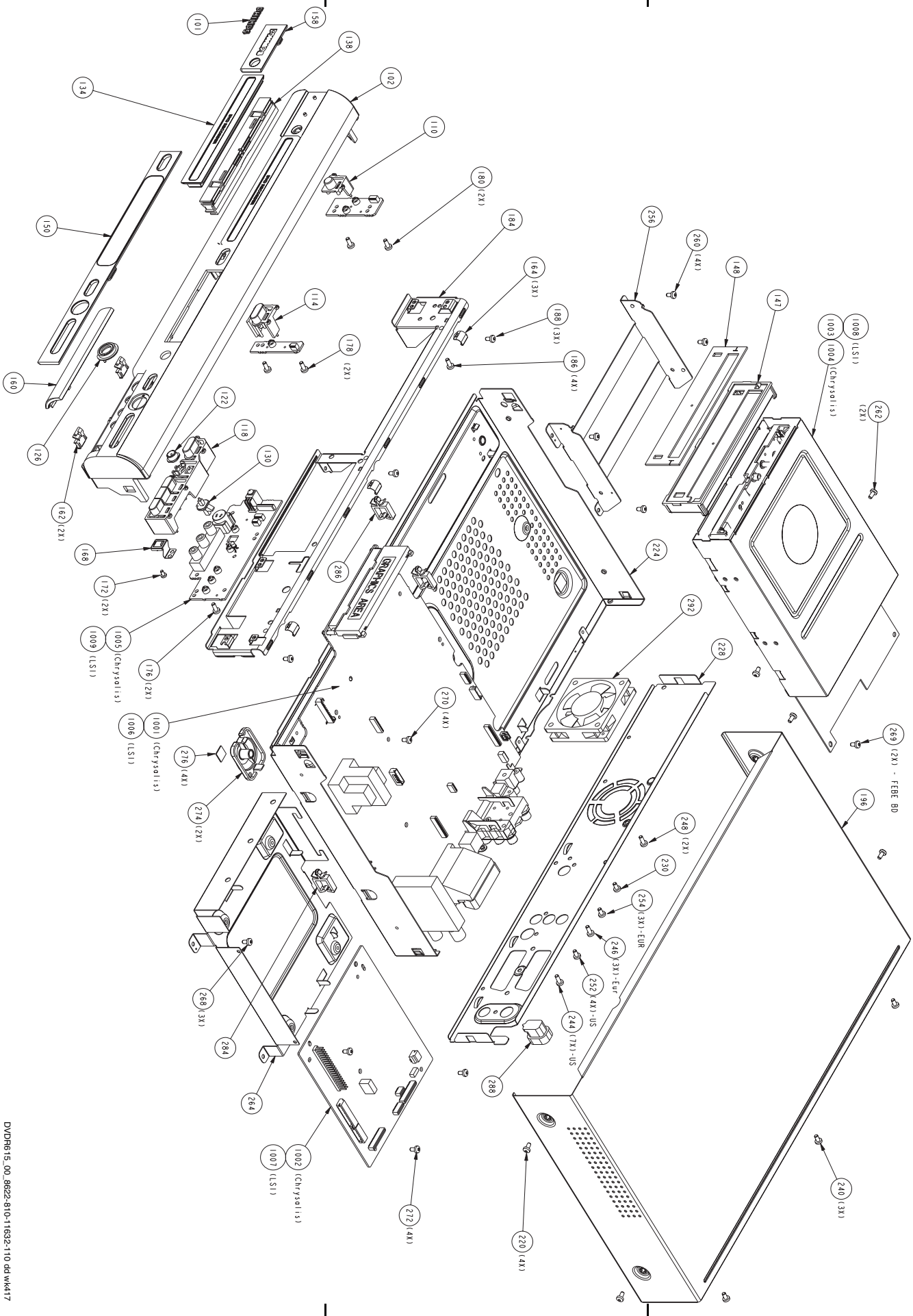
10.4 Exploded View of the Set



DVDR615_00_8622-810-11632-110 dd wk417

Figure 10-4

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MISCELLANEOUS - SET EXPLODED VIEW

Various

101	3139 247 51831	BADGE PHILIPS ASSY SILVER
102	3139 244 04761	CAB FRONT DVDR615/AP
110	3139 244 04561	BUTTON STANDBY DVDR615
114	3139 244 04531	BUTTON EJECT DVDR615
118	3139 244 04521	BUTTON SET DVDR615
122	3139 244 04491	BUTTON CAP REC DVDR615
126	3139 244 04511	RING REC DVDR615
130	3139 244 04501	LIGHT GUIDE REC DVDR615
134	3139 244 04551	COVER TRAY DVDR615
138	3103 604 00811	HOLDER COVER TRAY
147	3103 604 01141	COVER DUST
148	3103 603 20122	FOAM RUBBER SEALING
150	3139 244 04541	WINDOW DVDR615
158	3139 244 04481	WINDOW LEFT DVDR615
160	3139 244 04471	DOOR FLAP DVDR615
162	3103 604 00441	HINGE DOOR FRONT AV
164	3103 601 20231	SPRING GROUND
168	3103 601 20212	SPRING I-LINK
196	3139 241 21871	COVER TOP DVDR615
274	3103 604 00622	FOOT
276	3103 603 20041	CUSHION FOOT
288	4822 532 60948	BUSH 450H259010
292	2822 031 01441	FAN 12VDC 0.7W 3000RPM
333	3139 248 72121	REMOTE CONTROL DVDR615
336	2422 070 98231	MAIN CORD IEC 2A5 1M8 VH BK B
340	3103 308 92610	CABLE AUDIO 2X2RCA MALE 1.5MTR
341	4822 321 61579	VIDEO-CABLE
345	4822 320 50377	CONNECT. CABLE PAL
1001	3139 248 82902	PCBAS MOBO 04 AP2
1004	9305 025 84121	VAU8041/21 MODULE
1005	3139 248 83071	PCBAS FRONT DVDR615
8003	3139 111 04001	FFC FOIL 15P/180/15P BD 1MMP
8007	3139 111 03991	FFC FOIL 22P/280/22P BD 1MMP
8008	3139 110 34891	FFC FOIL 22P/120/22P AD 1MMP
8010	3139 111 03981	FFC FOIL 10P/280/10P BD 1MMP
8011	2422 076 00578	CBLE IEEE1394 F/480/SHR

MISCELLANEOUS VAU8041 MODULE EXPLODED VIEW

Various

5	3139 194 01581	SEALING STRIP
12	3104 148 01950	SLEDGE MOTOR
90	3104 144 10730	SUSPENSION
94	3139 190 40231	T6 PAN HEAD M2X8.5 TT-P SEMS FW
100	3139 197 50301	AV3.5 MECHANISM ASSY (DVD-M)
101	3139 197 60291	AV3.5 LOADER ASSY
105	3139 198 80010	SEALING STRIP
120	3139 198 00620	TRAY MOTOR
121	3104 144 04980	MOTOR PULLEY, TRAY
125	3104 144 10121	TRAY MOTOR BELT
147	3104 144 04272	TRAY
150	3139 197 60301	TOP PLATE ASSY
179	3104 128 09271	FEBE PCBA 4MB/32MB NO DV-IN DVDR610
179	3104 128 09281	FEBE PCBA 4MB/32MB W/ DV-IN DVDR615/616
190	3139 194 01541	HEAT SINK PAD (CENTAURUS)
191	3139 194 01551	HEAT SINK PAD (CHEETAH)
193	3139 194 01561	HEAT SINK PAD (DRIVER)

FRONT BOARD (KEY, STBY, OPCL & 5WSW)

Various

1120	4822 276 13732	SWITCH TACT PUSH
1122	4822 276 13732	SWITCH TACT PUSH
1202	4822 276 13732	SWITCH TACT PUSH
1203	4822 276 13732	SWITCH TACT PUSH
1205	4822 276 13732	SWITCH TACT PUSH
1209	4822 276 13732	SWITCH TACT PUSH
1210	4822 276 13732	SWITCH TACT PUSH
1920	2422 026 05301	SOC CINCH V 3P FJPJ1127 B
1921	2422 026 05307	CON MDIN H 4P F YKF51 B
1922	2422 025 17797	CON V 15P F 1.00 FFC 0.3 B

3211	4822 117 12063	NTC DC 5W 10K 5%

6200	9340 548 61115	SM PDZ12B
6201	9340 548 61115	SM PDZ12B
6202	9340 548 61115	SM PDZ12B
6203	9340 548 61115	SM PDZ12B
6204	9340 548 61115	SM PDZ12B
6211	9322 190 44676	LED VS LTL-1MHHR

7200	9322 185 95667	IR RECEIVER TSOP4836

MOBO (ANALOG) BOARD

Various

1100	2722 171 00042	VFD DISPLAY BJ928GN
1101	4822 242 82114	CERAM RESONATOR 8MHZ
1102	4822 242 70938	RES XTAL 32,768KHZ)
1300	4822 071 51002	FUSE RAD LT 1A 250V IEC
1301	9965 000 07788	FUSE RAD T2A IEC UL250V
1302	4822 252 11215	SURGE PROTECT DSP-301N-A21FA
1303	4822 265 11253	SOC FUSE V 1P F PTF/65 B
1304	2422 086 10786	FUSE RAD LT 4A 250V IEC A
1305	4822 253 30383	FUSE 5X20 HT 2A5 250V IEC B
1306	4822 071 55001	FUSE RAD LT 500MA 250V IEC A
1308	4822 071 51002	FUSE RAD LT 1A 250V IEC
1310	2422 086 10769	FUSE RAD LT 125MA 250V IEC A
1600	4822 242 10434	RES XTL 18MHZ432 12P HC49/U A
1700	2422 542 90125	TUN V+U PLL IEC BGIDK B
1900	4822 265 11154	CON V 22P F 1.00 FFC 0.3 B
1914	4822 267 11031	CON V 10P F 1.00 FFC 0.3 B
1931	4822 265 20723	CON BM V 2P M 7.92 VH B
1941	2422 026 05291	SOC CINCH H 8P F YEWHRDBU B
1942	2422 025 17797	CON V 15P F 1.00 FFC 0.3 B
1944	2422 026 05291	SOC CINCH H 8P F YEWHRDBU B
1947	4822 265 11154	CON V 22P F 1.00 FFC 0.3 B
1948	4822 267 10994	SOC MDIN H 4P F TCS7927 B
1949	4822 267 10994	SOC MDIN H 4P F TCS7927 B
1955	4822 267 31729	SOC CINCH H 1P F BK B
2102	4822 124 11968	220MF +80-20% 5,5V
2301	2020 554 90173	CERSAF KX 250V S 2N2 PM20 B
2302	2020 021 91506	ELCAP ZL 1000UF 20% 16V
2305	4822 122 31175	1NF 10% 500V
2307	4822 122 31175	1NF 10% 500V
2308	2020 021 91506	ELCAP ZL 1000UF 20% 16V
2310	4822 121 10512	275V 220N 20%
2312	4822 121 70386	47NF 10% 250V
2314	2022 020 00742	ELCAP LS 400V S 68U PM20 B
2316	2020 021 91506	ELCAP ZL 1000UF 20% 16V
2319	4822 126 14525	47PF 5% 1KV
2322	2020 021 91506	ELCAP ZL 1000UF 20% 16V
2325	4822 121 41857	10NF 5% 250V
2327	4822 126 10206	2,2NF 10% NP0 500V
2328	4822 121 51598	2,2NF 5% 400V
3124	4822 052 10109	10R 5% 0,33W
3300	4822 053 21335	3M3 5% 0,5W
3301	4822 053 21335	3M3 5% 0,5W
3316	4822 116 83872	220R 5% 0,5W
3319	4822 053 21684	680K 5% 0,5W
3330	2322 193 14477	RST MFLM PR01 A 0R47 PM5 A
3331	2322 193 14687	RST MFLM PR01 A 0R68 PM5
5100	2422 549 43062	IND FXD SM EMI 100MHZ 600R R
5101	4822 157 50964	100MUH
5300	2422 531 02546	TFM SMT SLOT SRW28EC9-E01V0* B
5301	2422 535 94634	IND FXD LHL08 S 2U2 PM20 A
5303	2422 549 44509	FIL MAINS 25MH 0A4 HF2022R Y
5304	4822 157 11737	22UH 10% 9X9,5
5305	4822 157 11737	22UH 10% 9X9,5
5306	4822 157 70826	2,4UH
5307	4822 157 11737	22UH 10% 9X9,5
5308	4822 157 70826	2,4UH
5400	4822 157 11706	10UH 5% 2,4X3,4
5401	4822 157 11706	10UH 5% 2,4X3,4
5402	4822 157 11706	10UH 5% 2,4X3,4
5551	2422 536 00019	TRANSFORMER 6RG (SAGA) B
5600	4822 157 11706	10UH 5% 2,4X3,4
5601	4822 157 11706	10UH 5% 2,4X3,4
5700	4822 157 11139	6,8UH 5%
5701	4822 157 11706	10UH 5% 2,4X3,4
5702	4822 157 11139	6,8UH 5%
5703	2422 549 43062	IND FXD SM EMI 100MHZ 600R R
5704	2422 549 43062	IND FXD SM EMI 100MHZ 600R R

6001	4822 130 11397	BAS316
6002	4822 130 11397	BAS316
6003	4822 130 11397	BAS316
6100	4822 130 80622	BAT54
6101	4822 130 80622	BAT54
6102	4822 130 11416	PDZ6.8B
6103	4822 130 11397	BAS316
6104	4822 130 11397	BAS316
6109	4822 130 11397	BAS316
6255	9322 175 41687	SOC FIB OPT JFJ1000 L
6300	9322 161 76682	SB340L-7024
6301	9322 161 76682	SB340L-7024
6302	4822 130 31083	BYW55
6303	4822 130 31083	BYW55
6304	9322 184 68682	STPS5L40-C2
6305	4822 130 31083	BYW55
6306	9322 184 68682	STPS5L40-C2
6307	4822 130 31083	BYW55
6308	9322 126 71673	BYT42M A
6309	9322 161 78682	SB360L-7024
6310	4822 130 31878	1N4003G
6311	4822 130 10871	SBYV27-200
6312	4822 130 11397	BAS316
6313	4822 130 11416	PDZ6.8B
6314	3198 020 55680	SM BZX384-C5V6
6315	9322 206 47683	1N4935
6316	4822 130 34142	BZX79-B33
6317	4822 130 80622	BAT54
6318	9322 206 47683	1N4935
6319	4822 130 30842	BAV21
6320	9340 548 69115	SM PDZ27B
6321	4822 130 34382	BZX79-B8V2
6322	4822 130 11397	BAS316
6400	9340 548 61115	SM PDZ12B
6401	9340 548 61115	SM PDZ12B
6402	9340 548 61115	SM PDZ12B
6403	9340 548 61115	SM PDZ12B
6404	9340 548 61115	SM PDZ12B
6405	9340 548 61115	SM PDZ12B
6406	9340 548 61115	SM PDZ12B
6407	9340 548 61115	SM PDZ12B
6408	9340 548 61115	SM PDZ12B
6409	9340 548 61115	SM PDZ12B
6410	9340 548 61115	SM PDZ12B
6411	9340 548 61115	SM PDZ12B
6412	9340 548 61115	SM PDZ12B
6413	9340 548 61115	SM PDZ12B
6500	9340 548 61115	SM PDZ12B

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6501	9340 548 61115	SM PDZ12B
6502	9340 548 61115	SM PDZ12B
6503	9340 548 61115	SM PDZ12B
6600	4822 130 11397	BAS316

7001	9352 668 47118	UDA1334BTS/N2
7002	4822 130 60854	DTA124EU-W
7003	4822 209 32071	MC33079D
7004	4822 130 60854	DTA124EU-W
7006	9352 670 99118	UDA1361TS/N1
7007	4822 130 61553	DTC124EU
7100	9322 196 98685	NCP301LSN47
7101	4822 130 61553	DTC124EU
7102	4822 130 40981	BC337-25
7103	3198 010 42310	BC847BW
7104	4822 130 41246	BC327-25
7105	4822 130 41246	BC327-25
7106	3198 010 42310	BC847BW
7107	3139 240 50921	TMP87CM74AF-5JP4 w/ mark ASP017-50921 (non Lead-free)
7109	3198 010 42310	BC847BW
7110	4822 130 61553	DTC124EU
7111	3198 010 42310	BC847BW
7112	9965 000 04199	BSN20
7113	3198 010 42320	BC857BW
7114	9965 000 04199	BSN20
7115	3198 010 42310	BC847BW
7117	3198 010 42320	BC857BW
7118	3198 010 42320	BC857BW
7119	3198 010 42310	BC847BW
7300	9322 183 38668	SM STS9NF30L
7301	4822 209 14933	TL431IZ
7302	4822 130 11336	STP16NF06FP
7303	4822 209 14933	TL431IZ
7304	9322 183 38668	SM STS9NF30L
7305	4822 209 14933	TL431IZ
7306	9322 163 75685	SM SI2306DS
7307	4822 130 61553	DTC124EU
7308	4822 130 11417	STP3NB60FP
7309	9322 180 12685	SM SI2312DS
7310	4822 130 41782	BF422
7311	9352 673 56112	TEA1507P/N1
7312	3198 010 42320	BC857BW
7313	3198 010 42310	BC847BW
7314	3198 010 42310	BC847BW
7316	9965 000 09548	PHOTOCOUPLER TCET1108G
7318	4822 130 40959	BC547B
7319	4822 209 14933	TL431IZ
7321	9322 163 75685	SM SI2306DS
7322	9322 163 75685	SM SI2306DS
7323	3198 010 42310	BC847BW
7324	4822 130 61553	DTC124EU
7325	9322 163 75685	SM SI2306DS
7400	3198 010 42320	BC857BW
7401	9322 179 71668	NJM2285M
7402	9322 173 41668	STV6618
7403	3198 010 42310	BC847BW
7404	3198 010 42310	BC847BW
7500	4822 209 62312	MC33078D
7501	5322 209 11102	HEF4052BT
7503	9340 219 30115	BC817-25W
7504	9340 219 30115	BC817-25W
7551	5322 209 11517	PC74HCU04T
7600	9322 186 87668	SM MSP3415G-QG-B8V3
7700	3198 010 42320	BC857BW

FEBE BOARD

Various

1000	2422 025 17955	CON V 6P M 1.00 SR R
1001	2422 543 01368	RES XTL 24M576 12P CX8045 R
1002	2422 543 01422	RES XTL 24M576 18P CX8045 R
1100	2422 025 17821	CON H 45P F 0.50 FPC 0.3 R
1302	2422 543 01025	RES XTL 16M93 20P CX-16F R
1400	2422 025 05548	CON H 4P F 1.00 FFC 0.3
1401	2422 025 18382	CON H 11P F 1.00 FPC 0.3
1601	2122 662 00152	PTC 1812 16V 0R18 PM
1602	2122 662 00136	PTC 1812 6V 0R21 PM
1901	2422 025 16389	CON BM V 22P F 1.00 FFC 0.3 R
1902	2422 025 16389	CON BM V 22P F 1.00 FFC 0.3 R
1903	8204 056 66001	CON V 7P M 2.00 PH R
1904▲	2422 086 11087	FUSE F 1A 125V UL R
1905	8204 056 66011	CON V 12P M 2.00 PH R
1906▲	2422 086 11087	FUSE F 1A 125V UL R
1907	2422 025 16729	CON BM V 10P F 1.00 FFC 0.3 R
1908▲	2422 086 11087	FUSE F 1A 125V UL R

2013	2020 021 91729	ELCAP RKV 35V 4U7 PM20 R
2014	4822 124 12095	100UF 20% 16V
2062	2020 021 91729	ELCAP RKV 35V 4U7 PM20 R
2071	2020 021 91729	ELCAP RKV 35V 4U7 PM20 R
2073	2020 021 91729	ELCAP RKV 35V 4U7 PM20 R
2081	2020 021 91729	ELCAP RKV 35V 4U7 PM20 R
2083	2020 021 91729	ELCAP RKV 35V 4U7 PM20 R
2098	4822 124 80151	47UF 16V
2107	5322 124 41945	22UF20% 35V
2416	4822 124 12095	100UF 20% 16V
2431	4822 124 23002	10UF 16V
2446	5322 124 41945	22UF20% 35V
2448	2020 552 95812	CER2 1206 X7R 16V 1U PM10 R
2515	4822 124 23002	10UF 16V
2533	4822 124 23002	10UF 16V
2538	4822 124 23002	10UF 16V
2580	5322 124 41945	22UF20% 35V
2612	5322 124 41945	22UF20% 35V
2653	5322 124 41945	22UF20% 35V
2654	5322 124 41945	22UF20% 35V
2666	4822 124 23002	10UF 16V
2667	4822 124 23002	10UF 16V
2668	4822 124 23002	10UF 16V
2669	4822 124 23002	10UF 16V
2812	4822 124 23002	10UF 16V
2818	4822 124 23002	10UF 16V
2828	4822 124 23002	10UF 16V
2838	2020 021 91857	ELCAP FK 6V3 100U PM20 R
2981	2020 021 91729	ELCAP RKV 35V 4U7 PM20 R
2989	2020 021 91729	ELCAP RKV 35V 4U7 PM20 R
2999	2020 021 91857	ELCAP FK 6V3 100U PM20 R

3000	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3001	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3003	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3004	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3005	4822 117 13523	220R 5% RESN 0.63W
3006	4822 117 13523	220R 5% RESN 0.63W
3007	3198 031 14720	RST NETW 1206 4X4K7 PM5 COL R
3008	3198 031 14720	RST NETW 1206 4X4K7 PM5 COL R
3009	4822 117 13523	220R 5% RESN 0.63W
3010	4822 117 13523	220R 5% RESN 0.63W
3025	4822 117 12662	10R X4 5%
3029	4822 117 12662	10R X4 5%
3084	3198 031 11010	RST NETW 1206 4X100R PM5 COL R
3085	3198 031 11010	RST NETW 1206 4X100R PM5 COL R
3541	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3542	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3543	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3562	4822 117 13526	150R 5% RESN 0.63W
3583	4822 117 13526	150R 5% RESN 0.63W
3584	4822 117 13526	150R 5% RESN 0.63W
3585	4822 117 13526	150R 5% RESN 0.63W
3587	4822 117 13526	150R 5% RESN 0.63W
3588	4822 117 13526	150R 5% RESN 0.63W
3589	4822 117 13526	150R 5% RESN 0.63W
3615	2350 035 10829	RST NETW ARV24 4X 82R PM5 R
3631	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3635	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3639	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3643	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3800	2350 035 10229	RST NETW ARV24 4X22R PM5 R
3801	2350 035 10229	RST NETW ARV24 4X22R PM5 R
3802	2350 035 10229	RST NETW ARV24 4X22R PM5 R
3803	2350 035 10229	RST NETW ARV24 4X22R PM5 R
3804	4822 117 13573	NETW 4 X 47R 5% MNR14
3805	4822 117 13573	NETW 4 X 47R 5% MNR14
3806	4822 117 13573	NETW 4 X 47R 5% MNR14
3807	4822 117 13573	NETW 4 X 47R 5% MNR14
3808	4822 117 13573	NETW 4 X 47R 5% MNR14
3809	4822 117 13573	NETW 4 X 47R 5% MNR14
3810	4822 117 13573	NETW 4 X 47R 5% MNR14
3811	4822 117 13573	NETW 4 X 47R 5% MNR14
3812	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3813	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3814	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3815	3198 031 13390	RST NETW 1206 4X 33R PM5 COL
3846	3198 031 14720	RST NETW 1206 4X4K7 PM5 COL R
3873	3198 031 14720	RST NETW 1206 4X4K7 PM5 COL R
3874	3198 031 14720	RST NETW 1206 4X4K7 PM5 COL R
3875	3198 031 14720	RST NETW 1206 4X4K7 PM5 COL R
3876	3198 031 14720	RST NETW 1206 4X4K7 PM5 COL R
3877	3198 031 14720	RST NETW 1206 4X4K7 PM5 COL R
3897	3198 031 11030	RST NETW 1206 4X 10K PM5 COL R
3903	3198 031 11030	RST NETW 1206 4X 10K PM5 COL R
3904	3198 031 11030	RST NETW 1206 4X 10K PM5 COL R

5000	4822 157 11499	BLM11P600SPT
5001	4822 157 11499	BLM11P600SPT
5002	4822 157 11499	BLM11P600SPT
5003	4822 157 11499	BLM11P600SPT
5012	4822 157 11499	BLM11P600SPT
5013	4822 157 11499	BLM11P600SPT
5016	4822 157 11499	BLM11P600SPT
5018	4822 157 11499	BLM11P600SPT
5019	4822 157 11499	BLM11P600SPT
5022	4822 157 11499	BLM11P600SPT
5101	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5102	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5103	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5104	3198 018 51090	FXDIND 0603 10U PM10 COL R
5202	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5300	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5301	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5400	2422 536 00501	IND FXD D62LCB 10U PM20 R
5405	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5501	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5502	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5504	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5603	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5607	2422 549 45322	IND FXD 0603 EMI 100MHZ 150R R
5614	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R

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5615	2422 549 45322	IND FXD 0603 EMI 100MHZ 150R R
5616	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5800	4822 157 11499	BLM11P600SPT
5802	4822 157 11499	BLM11P600SPT
5803	4822 157 11499	BLM11P600SPT
5804	4822 157 11717	BLM31P500SPT
5805	4822 157 11499	BLM11P600SPT
5806	4822 157 11717	BLM31P500SPT
5807	4822 157 11717	BLM31P500SPT
5808	2422 549 44991	IND FXD 0603 EMI 100MHZ 600R
5900	4822 157 11499	BLM11P600SPT
5901	4822 157 11499	BLM11P600SPT
5902	4822 157 11499	BLM11P600SPT
5903	4822 157 11499	BLM11P600SPT
5904	4822 157 11499	BLM11P600SPT
5905	2422 536 00598	IND FXD 1210 1U5 PM20 R
5906	2422 549 45634	IND FXD 0603 EMI 100MHZ 60R R
5909	2422 549 45634	IND FXD 0603 EMI 100MHZ 60R R
5914	2422 549 45634	IND FXD 0603 EMI 100MHZ 60R R
5915	2422 536 00598	IND FXD 1210 1U5 PM20 R
5916	2422 549 45634	IND FXD 0603 EMI 100MHZ 60R R
5917	2422 549 45634	IND FXD 0603 EMI 100MHZ 60R R
5918	4822 157 11499	BLM11P600SPT
5919	2422 536 00598	IND FXD 1210 1U5 PM20 R
5920	2422 536 00598	IND FXD 1210 1U5 PM20 R
5921	4822 157 11499	BLM11P600SPT
5922	4822 157 70649	4,7UH (NL322522T-4R7J)
5923	2422 536 00598	IND FXD 1210 1U5 PM20 R
5924	2422 536 00598	IND FXD 1210 1U5 PM20 R
5925	3198 018 90050	FXDIND 0603 100MHZ 1K COL R
5926	4822 157 70649	4,7UH (NL322522T-4R7J)
5927	4822 157 11499	BLM11P600SPT
5928	4822 157 11499	BLM11P600SPT
5929	4822 157 11717	BLM31P500SPT
5930	4822 157 11499	BLM11P600SPT
5931	2422 535 94995	IND FXD 10145 10U PM20 R
5932	4822 157 11717	BLM31P500SPT
5933	4822 157 11717	BLM31P500SPT
5934	4822 157 11717	BLM31P500SPT
5935	4822 157 11499	BLM11P600SPT
5936	4822 157 11717	BLM31P500SPT

6001	4822 130 11528	1PS76SB10
6100	4822 130 11397	BAS316
6400	9340 571 37115	PMEG1020EA (PHSE)
6401	9340 571 37115	PMEG1020EA (PHSE)
6402	9340 571 37115	PMEG1020EA (PHSE)
6403	9340 571 37115	PMEG1020EA (PHSE)
6500	4822 130 81637	PMLL4148L
6501	5322 130 31928	BAS16
6502	5322 130 31928	BAS16
6503	5322 130 31928	BAS16
6604	4822 130 11522	UDZ15B
6605	9322 159 72685	MM3Z6V2 (ONSE) R
6900	4822 130 11528	1PS76SB10

7000	9352 683 02157	PDI1394P25BD (PHSE) Y
7001	9352 682 52557	PDI1394L40 (PHSE) Y
7005	9352 683 81115	74LVC1G32GW (PHSE) R
7006	5322 130 60159	BC846B
7007	9352 673 95518	SAA7118E/V1 (PHSE) R
7008	9322 116 74668	LD1117D33
7101	5322 130 60159	BC846B
7102	5322 130 60159	BC846B
7103	5322 130 60159	BC846B
7104	9340 547 21215	BSH205 (PHSE) R
7201	9352 713 79157	TZA1047HL (PHSE) Y
7300	9352 713 77157	TZA1042HL (PHSE) Y
7401	5322 209 82941	LM358D
7402	9352 735 89518	SA56202TW (PHSE)
7403	5322 209 82941	LM358D
7405	5322 209 82941	LM358D
7409	9322 164 64668	BA5995FM (RHM0) R
7500	9352 737 02557	PNX7850E_Z_M2A (PHSE)
7503	3104 123 97361	FLASH ASSY VAD8041 SW
7504	9322 166 67668	MT48LC4M16A2TG-7E(MRN0)R
7506	9322 184 07685	PST3642N (MITM)
7603	4822 209 17398	LD1117DT33
7607	9322 144 97668	LD1117DT (ST00) R
7608	8204 056 08131	LD1117DT18 (ST00) R
7800	9352 745 77557	PNX7100EH/C3 (PHSE) Y
7804	2722 171 08804	OSC XTL 4MHZ 20P FXO-31 R
7805	9352 115 40118	74LVC245APW (PHSE) R
7900	3104 123 97403	FLASH ASSY 4MB FEBE BACK-END
7902	9322 182 03668	MT48LC8M16A2TG-75(MRN0)R
7903	9322 182 03668	MT48LC8M16A2TG-75(MRN0)R
7904	9322 130 41668	M24C64-WMN6 (ST00) R
7905	9322 130 41668	M24C64-WMN6 (ST00) R
7910	5322 130 60159	BC846B
7913	9352 684 56115	74LVC1G04GW
7914	5322 130 60159	BC846B
7915	9352 684 56115	74LVC1G04GW
7916	5322 130 60159	BC846B
7917	5322 130 60159	BC846B
7918	4822 130 61553	DTC124EU
7920	5322 130 60159	BC846B
7921	5322 130 60159	BC846B
7922	9352 456 80115	74HCT1G125GW
7923	9352 500 20118	74LVC08AD (PHSE) R
7924	9352 317 20118	74LVC125APW (PHSE) R
7926	9322 191 99685	NCP303LSN29 (ONSE) R
7927	9322 188 69668	STS5DNF20V (ST00) R
7928	9322 188 69668	STS5DNF20V (ST00) R
7929	9322 188 68668	NCP1570D (ONSE) R
7950	9340 425 20115	BC847BS (PHSE) R

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